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JUN 25 1919

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Railway Age

FIRST HALF OF 1919—No. 25

NEW YORK — JUNE 20, 1919 — CHICAGO

SIXTY-FOURTH YEAR

Published weekly by Simmons-Boardman Pub. Co., Woolworth Bldg., New York, N. Y. Subscription Price, U. S. and Mexico, \$5.00 a year; Canada, \$6.00; foreign countries (excepting daily editions), \$8.00. Entered as second-class matter, January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

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EDITORIAL

Railway Age

EDITORIAL

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Director General Hines has issued a statement appealing to railway employees to give him their energetic co-operation in

Mr. Hines' Appeal to Labor

trying to operate the railways more economically. It will be interesting to see whether Mr. Hines' appeal has any perceptible effect. Railway labor has received advances in its wages and concessions affecting its conditions of work since government control was adopted which are costing approximately a billion dollars a year. The government is incurring a deficit in operating the railways which is running at the rate of about three-quarters of a billion a year. If cordial and energetic co-operation could be brought about between railway managers and employees in devising and carrying out efficiency methods, probably a large part if not practically all of this deficit could be wiped out without any increase in the hours of work or a reduction of the wages of a single railway employee. The result would necessarily be a large reduction in the number of employees, because wages are so large a part of total railway expenses that without increases in efficiency having the direct effect of reducing the number of men employed, no large economies can be effected. It has seldom been possible on any individual railway and never possible on the railways as a whole to secure the good understanding and co-operation between the managements and the men necessary to obtain the greatest efficiency and economy. Thus far it has proved even more impracticable to secure this co-operation under government operation. Frankness requires us to express some skepticism as to whether Mr. Hines' appeal will do any good. The duty of railway employees, in view of the vast increases in wages they have received, is plain, but, unfortunately, the supposed rights of railway employees occupy a larger place in their thoughts than their duty. In this respect, of course, they are merely human; most people think and talk a great deal more about their rights than about their duties. As long, however, as both employees and employers in the various lines of industry constantly subordinate consideration of their duties to consideration of their rights, the difficulties in the way of securing the increases in industrial efficiency which are needed to further the best interests of all, will not be removed.

A syndicate of American bankers, headed by the National City Company of New York, have arranged to sell in this

Sweden Bidding In Our Markets

country \$25,000,000 of Swedish Government twenty-year six per cent bonds. The offering price of these bonds is 99½, which is approximately the same price at which the Norwegian Government six per cent bonds, sold in this country some time ago, are now dealt in on the open market. The Swedish loan is particularly interesting for a number of reasons. In the first place, prior to the war, Sweden bought railroad supplies both from Germany and from Great Britain, and was, moreover, a fairly large manufacturer of machinery and tools herself. The proceeds of the present loan are, presumably, to be used in the purchase of machinery and tools, textiles, and possibly some other goods in this country. It is understood that the machinery and tools include some railroad supplies. Another interesting point about the loan is

the indication which it gives of the change that has taken place since the signing of the armistice and the lifting of the restrictions on foreign exchange. At one time in 1917, a Swedish krona was worth a little over forty-seven cents in New York. The parity of American and Swedish money makes the krona worth a little over twenty-six cents. At present, the krona is selling in New York at about twenty-six cents, and before the offering of the loan, was selling at about twenty-five cents. In the four months ended April 30, 1919, exports from the United States to Sweden amounted to over \$38,000,000, while our imports from Sweden were between \$2,000,000 and \$3,000,000. The large premium at which kronars were selling in this country in 1917 and 1918, was due, not to an excess of Swedish imports into the United States over United States exports to Sweden, but to the fact that England and other of our allies were importing heavily from Sweden and settlement for these transactions was being made through New York at a time when the exchange rate of the pound sterling in New York was "pegged," that is, fixed arbitrarily. The large premium on the krona in New York was the reflection of the relations between our allies and the Scandinavian countries, and even during the war, Sweden was an importer from the United States rather than an exporter to this country. The ability and willingness of this country to place credit at the disposal of Sweden marks a definite stage in the progress of gaining a market for American goods in that country.

Mr. Borland's report on the Fort Washington collision of January 13, noticed on another page, brings out the fact

The Fort Washington Collision

that there were failures at five points; nothing new or surprising, perhaps, yet a fact to be noted, lest we concentrate too fully on the main point, the mistake or neglect of the engineman. The second point is the failure of the monitorship of the fireman. This weakness is so nearly universal that there is, perhaps, no occasion for discussing it; though in this case the fact that the engineman and the fireman were in separate cabs adds significance to the point. The third point is the engineman's defective record. It is not for a distant critic to say that a better man should have been on this engine; circumstances may have afforded various reasons for having this man there; but the fact remains that when a superintendent sets out to have his best trains manned by the best men he has undertaken to sustain his road's reputation at a vital point, and is bound to give reasons for any condition lower than perfection. The fourth failure was in the weakness of the brake power. This cannot be called a major feature, for all space-interval and flagging rules provide for a margin of safety; but this was one point in the aggregate of reasons why the railroad, in this case, did not reach 100 per cent safety and save the fourteen lives. The fifth point was the negligence of the flagman. It is no different from a hundred other cases, except that the evidence in this case is peculiarly strong, clear and understandable. On this point Commissioner McChord has given us a two-page excursus (which we print following the notice of the official report) which operating officers may do well to paste in their scrap-books. He does not present any facts that they did not

know before, but his Bureau of Safety has given him a telling array of citations, which give "body" to his dissertation and which will be useful to refresh one's memory when going to the confessional or in any quiet night season. If any reader is so busy as to be deterred by the length of this essay on flagging he will do well to turn to the fourth paragraph from the end, about "the human tendency toward minimum effort"—toward what some people call laziness.

Nine investment bankers out of ten will tell you that when it comes to investments, the American people have no imagination.

Investment in Foreign Securities

In Indiana one of the standard investments is gravel road bonds. Why? Not because it is a particularly sound investment, but because the investor can go out and see his security, or at least a gravel road similar to the one which his investment will help to pay for. If the American public is really devoid of imagination in regard to investments, the task of establishing a great American export business is nearly hopeless. The United States Investor, in a recent issue, tells of a contract which France is to place in this country for 100,000 cattle which we secured in competition with the Argentine, simply because this country was able to finance the purchase; in other words, extend credit to France, whereas the Argentine was not able to do so. American bankers, except a very few, know nothing about foreign investments. The few, however, who are working on this problem of financing American exports have at their command the resources of some of the largest financial institutions in the United States. It ought to be possible for these bankers to arouse the imagination of the general public. Recently there have been two very interesting advertising campaigns carried on in the East, based on the expectation of arousing the romantic imagination of comparatively wealthy people. One was a series of advertisements illustrating the various phases of pearl fishing. The other was a campaign carried on by a firm selling furs, the advertisements illustrating the life of the fur trapper in the far north. Englishmen with their supposedly less imaginative perception will buy shares in a diamond mine in South Africa, a rubber plantation in Brazil, and an oil well in Mexico. Would it not be worth while for the banking interests which are forming great combinations to aid American exporters to make an attempt through a campaign of advertising, to help the American people visualize the romance of foreign investment?

One more evidence that, in many of our everyday affairs, war conditions have passed, is found in the renewal of complaints of the whistle nuisance.

Abuse of the Locomotive Whistle

The problem of making all enginemen reasonably careful in the prevention of noise—whether by whistles, or bells, or pop valves or by just plain banging of cars—is one small burden from which the careful superintendent is never free; but for the past year or two people who rightfully might complain have held their peace. The following press despatch from Macon, Georgia, serves as a reminder that the problem is still a live one:

MACON, Ga.—Being an alderman in the city of Macon at the present time, lacks a whole lot of being the sinecure it is imagined. People living in the vicinity of the various railroad lines have combined to stop the blowing of whistles during the night. The matter comes before the city council regularly each week, but so far, the kickers have failed to get results. Petitions failing to have their effect, new tactics have been adopted, and now each night the aldermen are roused from their slumbers in the dead of night by telephone, some stranger calmly informing the alderman that "the whistles are blowing."

The despatch may be somewhat colored, but its elements

are true to life. This note is not being written with the idea of reforming all of the enginemen, or even of telling them their duty; but to cite a praiseworthy rule on the noise nuisance, that of the Pennsylvania Railroad, which is printed in another column. To make the practice as praiseworthy as the rule, however, it is necessary to pay constant attention to those clauses which we have printed in italics. All of the principal roads have a rule on this subject; how many trainmasters find themselves able successfully to enforce those italicized features? Rule 468 seems to refer to noises which are considered objectionable, not by the railroad, but by the citizens, those of reasonable minds and those of the other kind. Mr. Statler, the hotel-keeper, professes to be able always to admit that complainers are right; can it be done in this matter? How long does it take to teach the average engineman to use the whistle "judiciously"? What percentage of the whistle signals on your road are no louder and not a second longer than is actually necessary?

Interstate Commerce Commission and Adequate Railway Revenues

ASSUMING THAT THE RAILWAYS are to be returned to private operation, the heart of the railroad problem is the question of how the companies are to be assured net operating income adequate, first, to enable them to pay returns on their outstanding obligations and refund them as they become due, and second, to raise sufficient new capital to improve and enlarge their facilities enough to handle the commerce of the country.

The new legislation may work fairly successfully, though defective in other respects, if it deals clearly, wisely and effectively with this question. However perfect it may be in other respects, if it does not deal clearly, wisely and effectively with this question, it will be a failure, because under it private operation will be a failure.

Before government operation was adopted regulation had proved a failure because it had denied to the railways the opportunity to earn adequate returns. This is denied in some quarters. It is denied in a recent public statement by Commissioner McChord of the Interstate Commerce Commission. He points out that net operating income in the three years 1915-1917, which immediately preceded the adoption of government control, was the largest in amount ever earned in three consecutive years. This proves nothing as to the wisdom and success of the old policy of regulation.

The most pertinent and convincing evidence regarding the success or failure of the old policy of regulation, is afforded by the facts as to the tendency of railway development under it. Before the state legislatures and commissions and the Interstate Commerce Commission began to make reductions and prevent advances in rates regardless of advancing operating costs, the mileage of new railways built in the country annually was about 5,000 miles. Since 1907 new construction has never equalled 5,000 miles in any year, and in the last three years before the United States entered the war, it was only 3,563 miles, an average of less than 1,200 miles a year. There were corresponding declines in the other facilities provided.

This downward tendency of the provision of new facilities was of course reflected in the statistics regarding new investment. The investment made in road and equipment in 1910 was \$778,000,000 and in 1911 \$808,000,000. In 1911 the Interstate Commerce Commission rendered its decision in the first rate advance case, refusing to grant the carriers the advances for which they asked. In the next year—1912—the investment made was \$680,000,000; in 1913, \$478,000,000; in 1914, \$584,000,000; in 1915, \$311,000,000 and in 1916, \$268,000,000. In every year from 1911 to 1916, ex-

cept 1914, there was a decline in investment; and in 1916 the investment made was less than one-third what it was five years before.

Why was there this decline in investment? The average percentage of net operating income on cost of road and equipment earned in each year from 1910 to 1915, inclusive, as reported by the Commission, was as follows: 1910, 5.73 per cent; 1911, 4.87 per cent; 1912, 4.62 per cent; 1913, 5.12 per cent; 1914, 4.19 per cent; 1915, 4.09 per cent. The average return in the five years ending with 1905, according to the Commission, was 4.97 per cent; in the five years ending with 1910, 5.41 per cent; and in the five years ending with 1915, 4.56 per cent. The percentage of return earned in 1915 was the smallest in any year since 1899. The tendency of net operating income under government regulation down to and including the fiscal year ended on June 30, 1915, explains the decline of investment.

But, it is said, in the three years 1915-'17 the railways earned the largest operating income they ever earned in any three years. What was that due to? In the fall of 1915 the railways began to feel the effects of the tremendous increase of industrial activity in this country which had been caused by the war in Europe, and in the year ended on June 30, 1916, there was an increase of 24 per cent in freight traffic, and of 21 per cent in freight earnings. No such increases in volume of traffic and in earnings ever occurred before, or probably ever will again. The traffic and earnings in the calendar year 1916 were larger still. In the calendar year 1917, they showed a still further increase, although because of large increases in expenses there was a decline in net operating income.

The foregoing facts show that under ordinary business conditions in the United States in the five years up to and including the fiscal year 1915 the policy of regulation followed resulted in a steady decline of the percentage of income earned by the railways. This crippled the companies in raising new capital. Then suddenly, owing to abnormal conditions created by the war, there was a tremendous increase in traffic and earnings, and in consequence a large increase in net operating income. The policy of regulation had nothing to do with this increase in traffic, or the large increase in operating income which it caused. If normal conditions had continued the percentage earned probably would have continued to decline.

Railway officers and investors know this. Therefore railway men and investors judge of the effects which the old policy of regulation would produce in future, not by the abnormal results caused by abnormal conditions in 1916 and 1917, but by the normal results produced by normal conditions and regulation in the years preceding 1916. They know that just before this abnormal increase in traffic came, more miles of railways were in the hands of receivers than ever before. They know this affords a better measure than the earnings of 1916 and 1917 of the fairness and wisdom of the old policy of regulation.

But this is not the whole story. The enormous increase of business came so quickly that for a time it was impossible for the increase in railway expenses to keep up with it. But in 1917 the expenses again began to grow faster than the earnings. This was especially true as to the railways in eastern territory. They asked for an advance of 15 per cent in freight rates early in 1917, but were given only half of it. Finally in December, 1917, when it had become clear that a large advance in rates would be necessary if increased expenses were to be offset, the Interstate Commerce Commission side-stepped the acute problem presented by sending a special report to Congress in which it said, in effect, that it could not grant the advance in rates which were needed to keep the railway companies solvent. Within a month government control was adopted. A few weeks afterward the Commission granted another advance of about 7½ per cent in the

freight rates of the eastern railways; and before we had had six months of government control freight rates throughout the country were still further advanced 25 per cent, and passenger rates 50 per cent.

To one who knows this record it is futile to say that the railway companies need have no fear of future regulation by the Interstate Commerce Commission. They have the best of grounds for fearing any legislation which would leave almost entirely in the hands of the state commissions and the Interstate Commission the determination of what measure shall be applied in deciding what the railways shall be allowed to earn.

There are available certain other methods which may be adopted. Congress may fix by law the percentage of return the railways shall be allowed to earn, and on what basis. It may specifically instruct the Commission to so fix rates as to make net operating income sufficient to enable the railways adequately to develop their facilities. It may delegate the determination of what return they shall be allowed to earn to some other governmental body. The Esch-Pomerene bill is fatally defective because it leaves the determination of this question to the Commission without in any way indicating that rates, as a matter of public policy, must be made adequate.

Are the Roads Being Over-Maintained?

THE RAILROAD ADMINISTRATION appears to have suddenly become obsessed with the fear that it is over-maintaining the railways and that heroic measures must be adopted to prevent this. An order was issued by the Director General on May 27, instructing Federal managers to so hold down maintenance of way expenditures that the ratio of these expenditures to the operating revenues for June would not exceed the average yearly ratio during the three-year test period. This drastic order must have presupposed that the ratio of maintenance expenditures to operating revenues during the test period is a fair measure of what present expenditures should be. Any such assumption would be grossly erroneous. That the Railroad Administration has since realized this is indicated by the fact that the order has since been annulled, at least for June.

The obligation of the government to the railway companies with respect to the maintenance of their properties is set forth in the standard contract, by the terms of which the director general is required so to maintain each property that it will be "returned to the companies at the end of Federal control in substantially as good repair as it was on January 1, 1917," provided that an annual expenditure for such purpose equal to that of the test period, equated for changes in costs of labor and materials, shall be considered as full compliance with this obligation. The fear of the Railroad Administration that the government will exceed its obligation in this respect is in direct contrast with the anxiety on the part of most railway men that the government will leave them with a large accumulation of deferred maintenance at the termination of the period of federal control, settlement for which will be made only after extended controversy, if at all.

According to the figures on which this order was based, maintenance of way expenditures consumed 15.3 per cent of the operating revenues for the first three months of 1919, as compared with 11.1 per cent for the same months of the test period, and 12 per cent for the entire test period. Rather than indicating excessive maintenance, these figures reflect the radical changes in conditions during the last four years which make these ratios valueless for comparative purposes. All costs of operation have risen greatly during this interval, those for the first three months of 1919 being 85 per cent greater than for the same period of 1916, while earnings

increased only 38 per cent. It is this failure of earnings to keep pace with expenditures that has brought the operating ratio up to 91.5 per cent, as compared with 72.4 per cent three years ago, and has reduced the operating income from \$214,000,000 in the first quarter of 1916 to \$45,977,752 in 1919. No further data should be necessary to demonstrate the undesirability of attempting to apply pre-war relations between earnings and any part of expenses to present conditions. With the ratio of all operating expenses to earnings increased from about 70 per cent in the test period to over 90 per cent at present, to suggest that one large item of expense shall be made to bear the same ratio to earnings that it did in the test period borders on the absurd.

The director general stated in his order that the ratio for the calendar year 1918 was 13.3 per cent, as compared with 12 per cent for the test period, thus intimating that the roads were over-maintained during 1918. That this is purely a paper comparison which is not supported by the physical facts is best indicated by a comparison of the tie and rail renewals of last year, with those of the test period, these being the only two materials the 1918 replacements of which have been tabulated and made public. The rail renewals failed by 250,000 tons, or approximately 20 per cent, to reach the test period average of 1,350,000 tons, while tie renewals failed by 17,000,000, or 18 per cent, to meet the test period standard. Other important units of maintenance renewals are equally in arrears. It is therefore difficult to see how the Railroad Administration can justify its apparent position that the roads are being over-maintained.

The order was also ill-advised because it applied alike to the road which started its work early and had a large part of its season's program completed and to the road which was only starting. It was issued at a time when the best progress could be made and before the call of the harvest field depleted the forces. Its drastic nature is indicated by the fact that it would have required the laying off of as many as three to four thousand men on each of several Middle-Western roads.

It is unfortunate that the order was issued, and it is to be hoped it will not be renewed since maintenance of way expenditures should be determined by physical needs and facts and not by statistical ratios which are meaningless unless considered with reference to physical facts.

New Books

Efficient Railway Operation. By Henry S. Haines. 709 pages. The Macmillan Company, New York.

It is peculiarly difficult to get a true perspective in discussing the efficiency of American railroad methods. Louis D. Brandeis, when he was counsel for the Interstate Commerce Commission, raised a widespread but rather superficial discussion of the railroad question by asserting that a million dollars a day was being lost through inefficiency in railroad operation. A traveler who meets with a discourteous ticket seller or a grumpy conductor makes a mental comparison between the railroad business and the hotel business, forgetting that it is ten times easier to change a hotel clerk or to correct his errors, than in the case of a conductor. A shipper whose freight goes astray, possibly because of poor marking, compares the efficiency of the railroads to that of the large drygoods company and gives the railroad a very low rating. But these are unweighed averages, all of them. A careful and scientific investigation into the efficiency of American railroads has seldom been made even on a limited scale.

Government operation of railroads has afforded a helpful contrast by which the general public has been able to judge of the efficiency of railroad operation in America, at least

in many of its aspects, under private operation. Colonel Haines, however, studies the question from the point of view of the scientific student. He examines the factors which go to make up the business of transportation by railroad; he examines these in the light of history, in the light of comparisons with other countries and with other businesses and from the ideal standpoint—that is, in the light of what could be hoped for in the solution of the problems that they present. The work is undertaken in a strictly critical spirit; but at the same time it is the spirit of a friend, not an outsider, for the author has a full knowledge of the problems involved.

Colonel Haines is a veteran of the veterans, having served in both the mechanical and the engineering departments away back before the civil war. He was superintendent of the Charleston & Savannah through that war, and was the chief operating officer of the Plant System for 15 years ending with 1895. He had a wide acquaintance, and was president of the American Railway Association for nine years, 1887-96. This practical experience is reflected throughout the book in a wealth of detail, sometimes contained in the text itself; sometimes in the invaluable appendices. From this point of view the book may be regarded as both a text book and a reference work of incalculable value to railroad men. It would be hard to say whether the ambitious train master or the general manager would gain most from its possession and study. To the younger men it answers, for the period which it covers, as a very useful historical sketch.

The scope of the book is very broad. After a brief but fascinating history of transportation from the dawn of history, the author describes in some detail the modern developments of motive power, of rolling stock, of substructure and superstructure of roadway, traffic, transportation and what he calls operation. By traffic, Colonel Haines means service, which includes safety, speed, car supply, etc. "Transportation" is self-explanatory, but by operation he means real control of operation, including both transportation and what he calls traffic.

The chapters on operation are possibly the most interesting in the book. They will be appreciated by the general reader as well as by railroad men. After all, it would be useless to show that American engineering skill and American ingenuity had devised the best tools for transportation of which we have any knowledge, if it could not be shown also that American genius for organization had so utilized these tools as to get from them a large measure of their potential efficiency. In this chapter on operation, Colonel Haines critically examines American railroad organization and the methods used for control of the organization, and sums up his conclusions in this regard as follows:

"The exercise of executive control of a high order requires a combination of knowledge and experience with natural ability, a sense of justice and honesty of purpose. These qualifications have been eminently conspicuous in the men who have brought our railroad system into the state of efficiency by which our national resources have been marvelously developed and our prosperity augmented; and, furthermore, by which railway operation elsewhere has largely profited. It is not to be expected of our railroad managements that they have attained the highest possible stage of efficiency, nor is this claimed for them, for the field for investigation in railway operation is continually broadening, as in other fields for research. General practice will always lag behind the pioneers in every art. In this respect, it will be difficult to prove that our railway managements compare unfavorably with those in other countries or with the directors in other fields of production or distribution at home or abroad."

So broad is the scope of the book that it is out of the

question to discuss any but a very few of the points which the author covers. There are many points on which practical railroad men, as well as other competent critics in the railroad field might disagree with the author. For instance, while most railroad men would agree that questions of policy should be left to the board of directors, how far this should apply in regard to "terms and conditions of employment" is a question about which there is no settled agreement. Colonel Haines would relieve operating officers entirely of such matters; but our Central Railroad Administration at Washington, which undertook to relieve the federal managers entirely of just this responsibility has not yet demonstrated its success. Whether many American boards of directors are able, ready and willing to do any better may be seriously questioned.

It is a rare thing to find a practical man who can write really well about the art, profession or business in which he has proved himself an expert. This rare combination, however, is found in the author of "Efficient Railway Operation." The writing is both polished and scholarly. It shows no signs of old age. It has a leisurely tone that is quite unusual in present-day writing on technical and professional subjects. The book, however, is not technical, except, of course, in the statistical tables in the appendices. Any well-educated layman can understand and appreciate the discussion not only of the history of the development of the railroads but of the operation of the roads and the engineering features which have gone to make this development possible. The book is, therefore, thoroughly well worth reading consecutively.

It is also a valuable reference work. The index is comprehensive and very carefully made. This is said with a full knowledge of how extremely rare it is to find a comprehensive index for even a short treatise.

A bibliography, so-called, is included, but apparently what is meant is a list of books which the author consulted, for certainly no attempt is made to give a complete list of even the most important books that have been published in the last 10 or 15 years on railroad subjects.

Colonel Haines has spent on this work a period of three or four years which, at his age, he might have claimed as a well earned leisure; but the literary and historical workshop seems to be his natural element—and this is a condition for the existence of which all students of railroad history will have occasion to be grateful. To foreign readers the book may be of somewhat less absorbing interest than to the American, because of its wealth of details which they will perhaps be likely to skip over; but in no other place can they find such a rich collection of facts combined with lucid and rational comment.

The book is not free from errors; in such an extensive and laborious undertaking no author could expect to attain perfection except by referring every chapter to a committee of specialists. The development of the electric train staff is credited (page 393) to the General Electric Company instead of to Tyer, Thompson and the engineers of the Union Switch & Signal Company. A foot note on page 394 gives the erroneous impression that yellow is the night color indication (in fixed signals) for "proceed" on the Pennsylvania Railroad. The distance from New York to Chicago, over the Pennsylvania Lines (page 588) is given as 870 miles, some 36 miles less than is shown in the time-tables. However, these errors are but as the small dust of the balance in a great mass of facts in which the reader gains interesting information on every page.

It is hard to conceive of anyone reading Colonel Haines' book with an open mind and a clear understanding who can fail to agree with the author that in this field of railroad operation Americans have made a brilliant record of efficiency; that American railway operation is in the highest degree efficient operation.

Letters to the Editor

The Selection of Local Officers

FORT WORTH, TEX.

TO THE EDITOR:

Since government control of railways became effective there have been many statements in the press about the lack of discipline, non-observance of rules and general inefficiency of railroad men, especially in train, engine and shop service. The truth of most of these allegations is evident to all who are not entirely blind to plain facts.

The writer recently re-read an article by E. H. Heath, published in the *Railway Age* of November 16, 1917. The author is a very close observer and a good judge of human nature, and he hits the "bull's-eye" in almost every paragraph. The general manager of today is rather dull of comprehension if he is not studying evident facts and their causes. Mr. Heath points out the principal reason for unrest and loose discipline, but his statement should be amplified by the following addition: "Some local officials vie with each other to find ways and means to violate the contracts that exist between the brotherhoods and the railroads."

There has been a great change in railroading in the past 10 years and local officials who would have been a success 15 years ago may be failures today.

My early training began under a superintendent who had served in the ranks as a civil engineer and he fairly had the itch to learn the practical side of train movement as well as all other branches that go to make transportation successful. This man climbed from the position of superintendent of a subdivision to general manager of the greatest railroad in the country, and this was done by the force of his ability in about seven years. The next best superintendent I worked for was in the West and he was taken from the freight department. If all the other local officials I have worked for in the past 30 years were put into these two men's shoes, they would rattle like peas in a gourd.

Chief clerks generally make better local officers than dispatchers for the simple reason that they are better "mixers" and are in a position to hear all transportation problems debated. Mr. Heath states, "Efficiency comes through persistent instructions by an efficient field staff, explaining the why as well as the how." Many local officers apparently think that efficiency is in the atmosphere and we absorb it as we do air. Efficiency in the rank and file of railroad employees is simply a result of good management. If the general manager does not know whether the general superintendent, superintendent and trainmaster know the factors of successful transportation, how can he be successful?

The braking problem on railroads gives the best illustration of the effects produced by the "I don't know." A prominent air brake man wrote me some time ago, "We have tried for 30 years to have the trains handled smoothly." I admitted it was a fact, but added that we had been trying all that time to use devices which we did not properly understand, and had failed to notice that the devices could not do in actual service what they did in the instruction car.

Engine crews are the only employees on a railroad who receive a progressive examination. They are literally surrounded with inefficiency, neglect, incompetency and theory. Despite this mass formation and attack on all sides, they are expected to deliver 100 per cent efficiency. The engineers have the experience and others have the theory.

This letter is not written to direct attention to the important fact that local officials must be trained, trained and for modern ideas.

AN OBSERVER.

Flagging and Its Relation To Railroad Accidents.

Review of American Experiences with the Flagging Rule; Things Needed to Improve the Practice

By C. C. McChord
Interstate Commerce Commissioner

THE REPORT of the Interstate Commerce Commission upon a rear-end collision which occurred on the Philadelphia & Reading Railroad near Fort Washington, Pa., on January 13, 1919, has recently been issued. The collision was between two passenger trains originating at Philadelphia; it occurred about 15 miles north of that city. One of these trains, a local consisting of 8 wooden coaches, left Philadelphia at 5:30 P. M. and was stopped and delayed just south of Fort Washington on account of a preceding freight train blocking the track. The following train, known as the Scranton Express, left Philadelphia at 6 o'clock. The engineman of this train stated that an automatic block signal located about 4,000 feet south of the point of accident indicated clear, and he proceeded past this signal with undiminished speed; under the circumstances, however, this signal should have been in the caution position. Approaching the point of accident, his view of the track ahead was obstructed by an overhead highway crossing with bridge abutments close to the track, also a railroad bridge over the Philadelphia & Reading track, together with sharp curves and trees located along the right of way.

The flagman of the preceding train had gone back some 1,500 feet for the purpose of protecting his train, but on account of the local circumstances, the engineman of the Scranton Express was unable to see him in time to bring his train to a stop before colliding with the preceding train.

The colliding locomotive telescoped in the rear coach of the local train for a distance of about 45 feet, entirely demolishing that car. Thirteen passengers and one employee were killed and twenty-two passengers were injured.

A thorough investigation and extensive tests of the signal system at this point were made by the employees of the railroad company as well as by representatives of the Interstate Commerce Commission. This investigation disclosed no condition which could have caused a false indication of the signal, and the conclusion was reached that the engineman either misread or overlooked the caution signal indication.

A contributing cause of the accident was the failure of the flagman of the local train to go back far enough to insure full protection to his train. The investigation disclosed that the flagman went back a distance of approximately 1,500 feet from the rear end of his train and he was within the range of vision of the engineman of the approaching train for an additional distance of about 750 feet. As the results of this accident show, sufficient distance was not provided to enable the engineman of the express train running at full speed to bring his train to a stop before reaching the point of collision. Tests made subsequent to the accident with a similar train confirm the conclusion that the flagman was not in position to warn the engineman of the approaching train of danger in time to enable him to prevent the collision.

The rule of the Philadelphia & Reading Railroad Company prescribing the flagman's duties in a case of this character provides that when a train stops or is delayed under circumstances in which it may be overtaken by another train, the flagman must go back immediately with stop signals a sufficient distance to insure full protection. According to evidence in this case a period of at least 15 minutes elapsed between the time the local train stopped and the time the express train approached. It is clear, therefore, that the flagman had ample time to have continued

back far enough to insure full protection to his train.

The flagging rule on the Philadelphia & Reading Railroad is similar to the rule in effect on practically all railroads in the country. Some roads have elaborated upon this rule to the extent of specifying minimum distances which are considered to provide adequate flagging protection. But experience has shown that on account of the widely varying factors affecting flagging protection, such as speed and weight of different trains, weather conditions, grade and curvature of track, it is impracticable from an operating standpoint to make this rule specific and absolute in its requirements. It is, therefore, a practical necessity to rely to a very considerable extent upon the experience, discretion and judgment of a flagman for the proper protection of his train under the local circumstances and operating conditions existing in each case. This is true not only with respect to the interpretation of the requirements of a rule when applied to any particular location, but also to the judgment of the man as to what constitutes adequate protection under any given circumstances.

It is a universally recognized principle or requirement where automatic block signals are in use that the signal system must not be relied upon entirely for protection; the fact that train movements are protected by automatic block signals does not alter the requirements of the flagging rule. Under the circumstances in the Fort Washington wreck, if the engineman of the express train had properly observed the caution indication of the automatic block signal involved, he would, no doubt, have been able to bring his train to a stop after seeing the flagman in time to prevent the accident. But the flagging rule contemplates that adequate protection shall be furnished in a case of this character, even though the engineman, as in this case, overlooks or for any reason fails to heed the signal indications. Had the flagman gone back as far as the available time permitted in this case or at least the maximum distance required for bringing a train running at full speed to a stop, he would have been able to warn the engineman of the presence of the preceding train in time to prevent the collision, notwithstanding the failure of the engineman to heed the signal indication. The flagman had had nearly 15 years' railroad experience and his service record was good. He exercised poor judgment in this case, and no doubt relied upon the automatic signals.

The Interstate Commerce Commission has been conducting investigations of serious railroad accidents for the past eight years. Since July 1, 1911, a total of 567 accidents have been investigated, of which 358 were collisions, and in 111 of these collisions flagmen were involved to a greater or less degree. Of the 358 collisions, 139 were rear-end collisions, and in this class of accidents there were 76 in which flagmen were involved. Of the total of 111 collisions in which flagmen were involved, 57 occurred on lines operated by the block system, while 54 occurred on lines where no block system was in use.

The records disclose case after case in which flagmen neglected or failed fully to carry out the requirements of the rules. In some instances it has developed that experienced men have grown careless and have acted in a perfunctory manner, apparently without realizing their responsibility.

There are also a large number of instances in which the flagman exercised poor judgment, due either to failure properly to realize what was required of him in a particular

case, or to lack of experience and sufficient instruction by experienced railroad men. Many instances may also be cited showing lack of proper supervision of men when entering railroad employment, or when assigned to trains as flagmen.

Another condition which has been found to exist is the fact that conductors too seldom give their flagmen specific instructions with reference to proper protection of their trains. In a large number of cases conductors have apparently taken it for granted that flagmen with comparatively little experience know what is required of them and can be depended upon properly to perform their duties. In many cases a suggestion from the conductor or a few words of instruction as to what was expected of the flagman would probably have prevented serious accidents.

One of the most disquieting features of the record of accidents in which flagmen were involved is the fact that a considerable percentage, and some of the most serious accidents which have been investigated, occurred on lines equipped with modern automatic block signals. The fact should be recognized that lines equipped with such signals carry the densest and fastest traffic in the country and perhaps in the world. It is a fact that frequently fast trains are run at such brief intervals that when a train is unexpectedly stopped or delayed, there is not time for a flagman to get back far enough to provide adequate protection for his train.

A Compendium of Flagrant Cases

An examination of the records of accident investigations suggests the following general classification of accidents resulting from the lack of proper flag protection.

1. *Carelessness and failure to realize responsibility of the position of flagman by experienced men.* Accidents wherein experienced flagmen fail properly to perform their duty are surprisingly common. In a recent case of this character, a train had been standing 25 minutes on the main line without protection; the flagman had visited various saloons during the preceding night and was in no condition to work. This man had had more than 7 years' experience as a trainman. In another rear-end collision, a passenger train had stopped at a flag station on account of low steam. The flagman went back and in about 20 minutes returned to the train to obtain a fusee on account of his lanterns beginning to burn low and also to see how much longer the train would be delayed. He had started back the second time, but had gone only 2 or 3 car lengths beyond the rear of his train when the following train passed him. At no time did he have any torpedoes with him, and he was unable to light the fusee as there was no cap on it. This flagman was a man of nine years' experience in train service.

In another case a train stopped with rear-end about half a mile outside of yard limits; the engineman whistled out a flagman, and the conductor told the flagman they would be there about two hours, but did not give him specific instructions to flag, as he was qualified and he considered him to be trustworthy. The flagman said he did not know the location of the yard limit board and thought his train was within yard limits, so he remained in the caboose reading and writing. Train stopped at the usual point and he said he had never gone back to flag in the month he had been running over this part of the road. Train had been standing one and one-quarter hours at the time of accident. Flagman had had eight years' experience of which four was as a flagman.

2. *Inexperienced and incompetent men.* In a rear-end collision between two passenger trains, resulting in the death of 14 persons and the injury of 200 persons, the collision occurred at night. The flagman did not go back a sufficient distance, and did not use either fusees or torpedoes, although he had both with him. The flagman entered the service of the company 24 days before the accident, had no previous railroad experience, and had not been examined on the rules.

In another case the flagman of a work train was given verbal instructions to go to the next station on a preceding

train and hold all trains in the opposite direction until his own train arrived. The evidence indicates that when a passenger train approached from the opposite direction he did not unfurl his flag and the signal he gave was such that the engineman of the passenger train took it for a wave of the hand or a salute, acknowledging it with two short blasts of the whistle and resuming full speed. No torpedoes were used, although the flagging rule required their use in all cases. The flagman had been in railroad service a total of only four months and had never been instructed, examined or qualified as a flagman.

In another case of this character, the flagman at fault had been employed on this road less than one week, but had had some previous railroad experience. He was assigned to duty as a flagman by the trainmaster's clerk; the only question asked was whether or not he had a watch. No instructions were issued to him, and he received none from his conductor during the trip. He stated that he went out without any knowledge of the operating rules and did not even have a time table; and that he paid only half a dollar for his watch.

In another case the investigation developed that men were employed for train service by a trainmaster's clerk who had never been examined on the rules. The examination given was very perfunctory and consisted merely of filling in answers to questions contained in a printed form which was supposed to be checked over by the clerk and supplemented by such explanations or instructions as he might give.

These and many similar cases point clearly to the menace of employing incompetent and careless men in responsible positions, and emphasize the need for the most rigid enforcement of rules and for frequent inspection and test by officers in order that they may know absolutely that rules necessary for the safe operation of trains are understood and obeyed.

3. *Poor judgment on the part of experienced flagmen.* The Fort Washington accident described above is an example of this class. In another case, a rear-end collision occurred on a six-degree curve, 550 feet from the point of curvature. From that point, there was 150 feet of tangent, 475 feet of 2-degree curve, and 1471 feet of tangent. The grade was descending for several miles, averaging about one-half per cent. The accident occurred during the day time, in clear weather. The flagman went back a distance of 30 car lengths, which brought him to the tangent 1,471 feet in length, and there put down two torpedoes. He then walked back and forth between the torpedoes and his train, being about 24 car lengths from his train when the following train passed him. According to the evidence, the engineman could not see the flagman until within about 8 car lengths of him, although his fireman and head brakeman could have seen the flagman a distance of 60 or 75 car lengths. The head brakeman called attention to the flagman, and the engineman made a service application of the air brakes when about 12 or 15 car lengths from the flagman. The speed of the train at the time of collision was very low, the weight of the 85-car train contributing materially to the damage. The flagman had had more than a year's experience and had a good record.

Accidents due to errors of judgment on the part of responsible employees cannot be entirely eliminated; the most that can be expected is to reduce their occurrence to a minimum by care taken in employing men for train service and by educating them to the responsibilities and duties of their position; also by making the rules as definite and specific as practicable.

4. *Lack of definite instructions or misunderstanding of instructions.* In one case of this character the conductor sent the flagman forward to assist in switching in place of an inexperienced head brakeman; he told the head brakeman to look out for a following passenger train but received no acknowledgment from him. The head brakeman said he had not been instructed to flag the passenger train and thought the reason no attempt was made to protect was because the conductor had time on that train. Head

brakeman had been in the service less than four months.

In another case the conductor of a work train sent a flagman to a station with verbal instructions to hold all trains until his train arrived, but the flagman understood that he was to hold all but first class trains. He failed to hold a passenger train, and a collision resulted. This flagman had never been instructed or examined on the rules, although he had been in the service of the railroad company 9 months. He had had some previous railroad experience.

Accidents due to the misunderstanding or misinterpretation of flagging instructions in connection with work train operation are common. Such cases occur because instructions are given verbally and without sufficient care to know that they are properly understood. Many roads require by rule that flagging instructions be given in writing and make it the flagman's duty to show his written instructions to the enginemen of trains flagged. This rule should be universal and should be strictly observed.

5. *Dense traffic or trains operated so close together as not to allow necessary time for flagman to go back a sufficient distance to provide full protection.* There have been a considerable number of disastrous accidents in which this was a contributing cause. In one case several years ago four sections of a fast freight train were being run at high speed in a dense fog at intervals of only about 5 minutes apart. The engineman of the third section decided that in view of the weather conditions it would be unsafe to attempt to go to the next station, 4.4 miles distant, in 10 minutes and clear an opposing passenger train. He therefore slowed down in order to take siding. As the flagman opened the caboose door on his way out to protect, he heard the fourth section approaching and called to the conductor to jump, but the latter did not have time to do so. The last open telegraph office was 5.6 miles distant, and the fourth section travelled that distance at an average speed of 48 miles an hour and intended going to the station beyond to clear the passenger train. The third section had been running at a lower rate of speed, and this, coupled with a minute or two lost when making the stop at the siding, enabled the fourth section to overtake the third section. There have been recent examples of accidents of this character, attended by much more serious results. In one of them, the first train stopped at 3.13 a. m. in a dense fog on account of an interlocking signal being in the stop position. The signal was cleared and the flagman called in, but when endeavoring to start, the engine stalled. The flagman again started back, but had gone only one or two car lengths when he heard the following train approaching. In the meantime, the engineman had started the train and it had traveled 6 or 7 car lengths before it was struck, at 3.18 a. m. The accident was due either to the engineman missing the automatic signal indications entirely or to his misreading them on account of high speed and dense fog. In another accident, a train stopped at 3.55 a. m. and the flagman started back, seeing the approaching train after he had gone but a few car lengths. When he saw that the engineman of the following train was disregarding the automatic signal indications, he began to run toward that train and was back about 700 feet when it passed him, colliding with his own train at 3.57 a. m. The accident was due to the engineman being asleep, but could probably have been prevented had the flagman had time enough to go back a proper distance and put down torpedoes, which he had with him.

In view of the evidence furnished by the accident investigations which have been conducted by the Interstate Commerce Commission, it is apparent that the safety of railway travel may be greatly enhanced by more careful attention to the requirements of proper flagging. This is a matter that should receive the constant attention of railway operating officers, by the promulgation of definite and easily understood rules, as well as by adequate measures to insure that the rules are understood and obeyed. The position of flagman should be made a preferred job, and should be invested

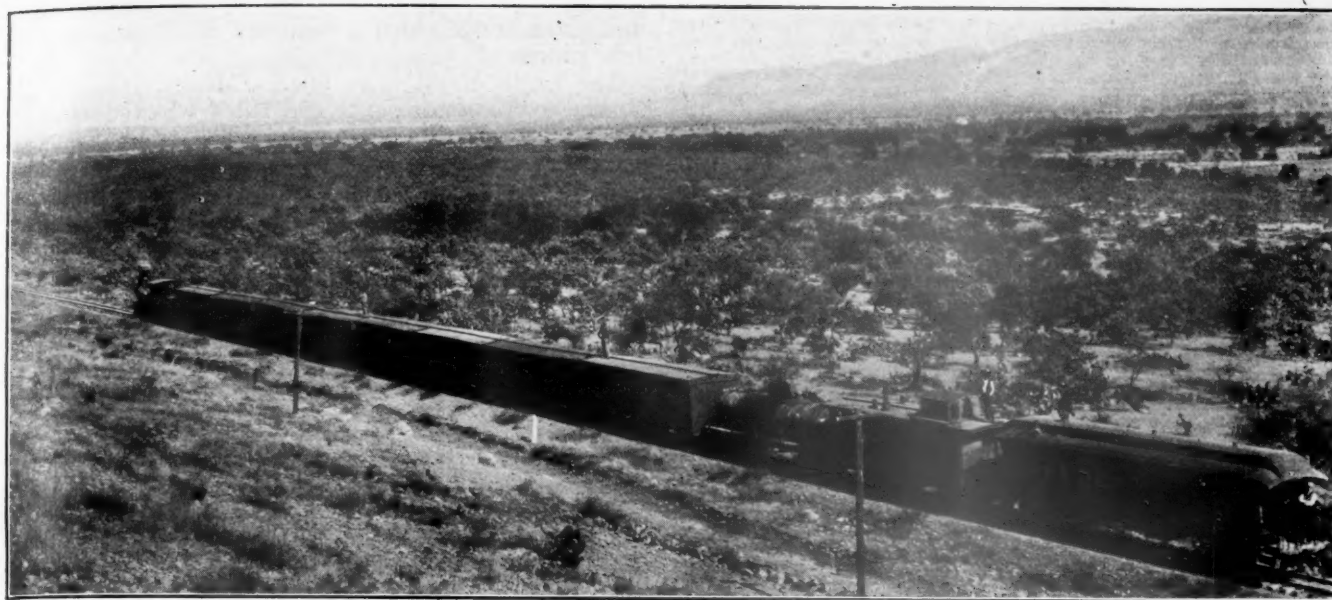
with more importance and dignity than is at present the case. Extraordinary precaution should be taken to insure that only competent men having a keen sense of their responsibilities, are given this position. In addition, special measures should be taken to see that flagmen are fully instructed in the performance of their duties, and that constant supervision over all details of their employment is given.

In connection with this important matter full consideration must be given to the human tendency toward minimum effort. Individuals are naturally indolent; they do not wish to exert themselves unnecessarily, and they are aroused only when ease is more unbearable than action. Men rarely do the best of which they are capable. They grow to the smallest dimensions of their job and then stop. No more effort is expended to perform a task than is required to produce a satisfactory result, and what is "satisfactory" is usually a variable quantity. There being no standard, the result obtained is generally far below the individual's capacity. It requires severe effort on the part of an individual to maintain his highest level of efficiency, and effort is a strain that he is loth to make. Consequently, he is contented with efforts that produce fair results.

Applying the fact of this well-known human tendency to the subject of flagging, the necessity for constant supervision and admonition, even with men of the highest grade, is apparent. Take a conscientious man of good intelligence, having a full sense of the responsibility imposed upon him, and at the outset he will exercise extraordinary care, and make a tremendous effort to do his job well. Then, as he becomes more familiar with the details of his task, the human tendency to do things in the simplest way, in a way requiring the least expenditure of energy, causes his efforts to relax, perhaps at first gradually and imperceptibly, until he is finally acting much below the level of efficiency demanded by the safety of his train. To counteract this tendency requires constant and intelligent effort on the part of railway operating officers. They should be especially vigilant in this regard, bearing always in mind that they themselves are subject to the same psychological propensity as are their subordinates. It is highly essential for them to know that men of the proper calibre are placed in these positions in the first instance.

On many roads flagmen of passenger trains are prohibited by rule from riding on the rear of an observation or private car. Such a prohibition is not in the direction of safety, and wherever the rule exists it should be rescinded. A seat should be reserved exclusively for the flagman just inside the rear door looking out. It should be made compulsory for a flagman to ride in the rear end of the last car of the train, as that, or on the rear platform, is the only place where he can ride and properly protect his train.

Occasionally accidents occur due to the existence of dangerous operating practices which have grown up with the full knowledge of responsible officials and which they have failed to take steps to correct. When such conditions exist, they are usually found in and around yards, interlocking plants and other points where train movements are more or less congested. In connection with one such accident, the superintendent stated that in his opinion it was a safe practice for transfer trains to use the main track within yard limits on the time of a first-class train, provided the crew of the transfer train were told by someone that the first-class train was late. Such operation is in violation of all rules provided for the safeguarding of train movements, and when responsible officials are acquainted with and acquiesce in the continuance of such practices, accidents are bound to occur. Not only that, but the effect on the employees under their jurisdiction is detrimental to a proper performance of their duties, for slackness and inattention by officials to violations of the rules on the part of employees will be reflected in their daily work and can only result in the occurrence of those accidents which it should be the duty of all officials to prevent to the best of their ability.



On the Mexican National, at Chirimoya Hill, near Jaral

A Trip Over the Railway Lines of Mexico

Construction and Operation Under Difficulties. Private
Trains to Secure Better Service

By P. Harvey Middleton

Executive Assistant, Railway Business Association

PART II.* PRIVATE LINES AND PROPOSED EXTENSIONS

THE TENACITY, enterprise and foresight of Harriman resulted in the construction a few years ago of the Southern Pacific of Mexico, which owns approximately 1,000 miles of line in some of the most beautiful country on this continent. This line is the result of the consolidation into a single system in Mexico of the lines controlled by the Southern Pacific system of the United States. The Mexican concession dates from 1905, and carried a subvention of \$10,058 U. S. currency per mile. This company has virtually absorbed what was hitherto called the Cananea, Yaqui River & Pacific, which had constructed lines from Nogales and Naco on the Pacific-Arizona border to Cananea, a copper-producing center in the state of Sonora, and down the west coast of Mexico on the Gulf of California from the port of Guaymas to Mazatlan, continuing to Tepic, from which point it is eventually to go to Guadalajara and Mexico City.

The company suffered considerably between 1910 and 1913, the traffic loss for this period being estimated at \$3,000,000, and the cost of maintaining the property during the same period was \$510,000 in excess of the revenue collected. The road in its progress southward crosses the wealthy regions of the Mayo and Yaqui rivers, which produce the best garbanza (chick peas) in the world. It passes Navajoa, the center for this product, and then touches San Blas, in the state of Sinaloa, where it connects with the Kansas City, Mexico and Orient. At Manzanillo it connects with the National Railways of Mexico.

The Southern Pacific of Mexico runs triweekly trains from Nogales to Naco via Cananea, 120 miles, but the property of the railroad in this section has greatly deteriorated, owing to the fact that it has been compelled on several occasions to withdraw all trains and practically abandon the roadbed. All

the bridges have been destroyed, and all rolling stock, roadbed, terminals and buildings will have to be renewed at an early date. At one point on this line, between San Blas and Culiacan, H. J. Temple, the general superintendent, rebuilt a bridge nine times. Every time the bandits destroyed it, Temple rebuilt it. A pile driver outfit was maintained at the bridge all the time, and in one month the bridge was rebuilt five times. As will be seen in the photographs reproduced in this article, the Southern Pacific of Mexico is compelled to operate armored cars on all trains.

A glance at the map published in the *Railway Age* of May 30 will show the small portion of the route between Tepic and Guadalajara which is still to be completed. The intervening distance is only a few miles, but it is in the difficult Sierra Madre country, requiring a number of tunnels—one of them nearly three miles in length—and much heavy grading. Representatives of the Southern Pacific are now in the field arranging for the early completion of the line. When this is done the Southern Pacific will have a direct connection between its great system in the United States and the entire west coast of Mexico—a region immensely wealthy in agricultural and mineral products.

Difficulties of Construction

The difficulties which will have to be overcome by the American engineers in completing this short stretch between Tepic and Guadalajara are graphically illustrated by the description of the survey made under exactly similar circumstances of the Cañon de Tamasopo on the Mexican Central by Max E. Schmidt, an American engineer. This cañon is 18 miles long, with perpendicular cliffs many hundred feet high on both sides.

When the first surveys were made, the cañon was devoid of roads or trails. The sun hardly ever penetrated the rockbed where the engineers

*The first article will be found in the *Railway Age* for May 30, page 1297.

camped, and where a sudden rain in a few hours might create a torrent that would fill the bottom of the cañon from side to side many feet deep, and carry away every vestige of the camp outfit and survey. At night, the noise of the rocks becoming detached from the cliffs above and falling into the cañon made sleep a succession of nightmares. When the actual location was made it was found that, in order to obtain proper grades, the road would have to intersect the cliffs at about half their heights. Difficulties then began in earnest. On many days not over 100 feet could be staked. All camp comforts had to be abandoned, and night would find the engineers camping on the cliffs, near the last stake, swinging their hammocks over rocks and precipices and securing what little rest they could. The roadbed as now finished is nearly all carved out of the solid rock. The total track curvature is 12,248 degrees, and in the aggregate only about one-fifth of the distance is on tangents.

Another American Line

A gigantic monument to the pluck and resourcefulness of American engineers is the Kansas City, Mexico & Orient, running from Kansas City to the Bay of Topolobampo on the Pacific Coast of Mexico, a total of 1,451 miles. It was promoted by Arthur E. Stilwell, who carried large parties of prospective stockholders from the western states, and in this way sold enough stock to carry on the construction work. The company was incorporated in 1900 under the laws of Kansas. Two sections are still under construction—one between Alpine, Texas, and the Rio Grande, 81 miles, and the other



A Gun Made in the Railway Machine Shop at Monclova, Mexico

between Sanchez, in the state of Chihuahua, and Los Hornillos, in Sinaloa, 198 miles.

This line also taps large agricultural and mining districts, it being estimated that there are about 500 mines and prospects on the line, as well as important haciendas producing sugar, cattle, grain, timber and fruit. Owing to bandit activities, service is at present irregular on the stretch of line from the Rio Grande to Sanchez, 287 miles.

The construction of this line is all first class, rails of 75 lb. weight, ties of California redwood, tarred, bridges well piled and provided with safe approaches and abutments. On the first hundred kilometers of the line, starting from the Pacific terminus at Topolobampo, there is but one bridge of any importance, namely, that crossing the Fuerte river, comprising three truss spans, each measuring 300 ft. in length. Several smaller bridges are from 15 to 50 ft. in length. On the second division, from Chihuahua east, however, when the Sierra is reached, the country becomes difficult to negotiate. In this long section tunnelling has been both expensive and difficult, the longest of the excavations being 1,520 ft., while there are two others which measure 810 ft. East of Chihuahua there is a bridge across the Chuviscar river near Aldama consisting of 10 spans of 50 ft. deck girders on concrete piers and abutments. Further on, crossing the Conchos river, there is a

steel girder bridge which is comprised of 17 spans of 50 ft. deck girders.

The length of the main line in Mexico, from the Rio Grande to Topolobampo, is 633 miles, which distance includes a portion of the Chihuahua & Pacific Railway, from Tabalaopa to Minaca, 120 miles, operated under lease. The terminus of the line at the bay of Topolobampo is a magnificent port, completely mountain-locked, measuring about seven square miles in area, with a depth over the bar at the entrance at low tide of about 22 ft.

Privately Operated Trains

A large part of the freight in northern Mexico is today handled in privately operated trains, of which there are about 30 in service. American mining companies have agreed to



The Southern Pacific of Mexico Protects Its Trains With a Gondola Car Cut With Slits for Rifles

rebuild a part of the destroyed cars on condition that such cars are to be used exclusively by them for a period of two years, after which they revert to the regular equipment of the service. From the American border to San Luis Potosi, 475 miles, on the government railways, shippers are dependent on private trains for quick service, freight being delivered in about ten days, at rates 50 per cent higher than the regular government rate. As freight is not received on private trains in less than carload lots, shippers of smaller quantities who require regular quick service must ship by express or pay



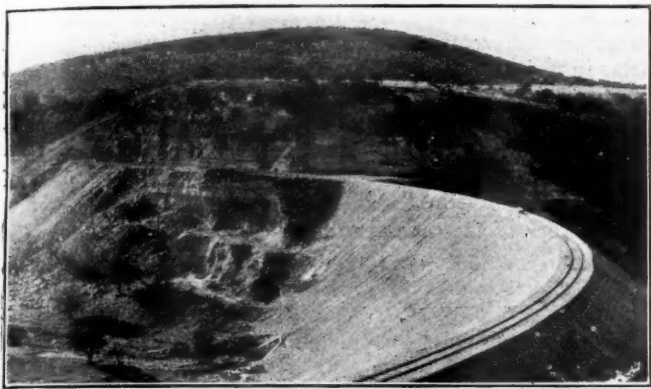
One of the Locomotives Left on the San Jorge Bay & Eastern After the Rebels Had Stripped That Road

insurance. There are special express trains leaving Nuevo Laredo on the Rio Grande for Mexican points twice a week.

An effort is being made at the present time to bring about an agreement with the United States Railroad Administration for the through billing of freight from points in the United States and Mexico, and for the regular interchange of cars. Through billing has been discontinued since 1915. American owned freight cars are, however, going across the border into Mexico under bond furnished by the shipper, and bond is released as soon as the car is returned to the United States. There are at present about 500 American owned freight cars in shops and in service in Mexico.

Extension of Lines

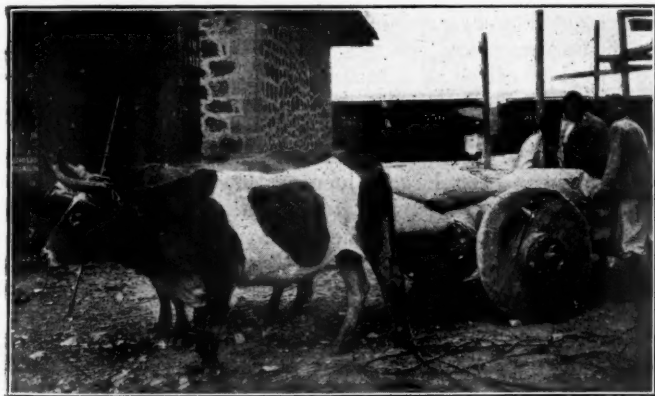
When I left Mexico City on May 7 the extra session of the Mexican Congress had completed its organization, and was starting to work on the big questions which it is now compelled to deal with. One of the most important of these is the extension of the railroads of the country, as recommended by President Carranza, and the purchase by the government of all or a majority of the stock of the United Railways of Yucatan. This company was incorporated under the laws of Mexico in 1902, and is a system formed through the consolidation of lines formerly independent and then owned by henequen (hemp) planters of the peninsula of Yucatan.



A Big Fill on the Mexican National Railway

There are four divisions—the Northern, between Merida, the capital of Yucatan, and Progreso, its seaport, and between Merida and Izamal, all standard gage; the Eastern, between Merida and Valladolid, with two branches, all narrow gage; the Western, connecting Merida with Campeche, capital of the state of the same name, and two branches, all narrow gage; and the Southern, between Merida and Peto, with one branch, narrow gage.

Since 1914 the Yucatan railways have been operated by the local government of the state of Yucatan. The share capital is 23,000,000 pesos (\$16,500,000), in addition to which there



The Other Extreme of Transportation in Mexico

is an issue of \$4,125,000 first mortgage 5 per cent redeemable gold bonds issued in London. At the time of my visit to Yucatan on May 12 there were 500 miles of railway operating on schedule time. Track was in good condition, but rolling stock was badly in need of repair.

Three new lines are proposed for Yucatan. The first would link the Yucatan system with the territory of Quintana Roo, running through Peto, Yucatan, Bacalar and Santa Cruz. Surveys for this line were made under the rule of Porfirio Diaz. The second extension, also proposed by Diaz, would connect Santa Lucrecia, in Vera Cruz, to Campeche, connect-

ing with the National Railway of Tehuantepec across the isthmus. The third proposed line will run from some point on the Southern Pacific, between Magdalena and Hermosillo, to Ensenada, the capital of Lower California. The completion of these lines will enable troops to be transported by rail from any part of the country to Lower California without entering the United States.

The American Smelting & Refining Company is also planning the construction of a new line to be operated in connection with its extensive mines and smelters in the states of Chihuahua and Durango, and will expend some \$5,000,000.

Smaller American Lines

Another American owned line is the Mexican Northern, with offices at 82 Beaver Street, New York, which has a total track of 78 miles and runs from Escalon, in Chihuahua, to Sierra Mojada, connecting that region with the Mexican Central. This line is now under the control of the Mexican government. The Mexico Northwestern Railway, incorporated in 1909 under the laws of Canada, with offices at 115 Broadway, New York, was formed for the purpose of providing northern Mexico with railroad facilities. It has 476 miles, and is still privately operated. It owns the following lines: The Chihuahua & Pacific (incorporated in 1897 in



Bridge Across Rio Grande Between Pedras Negras and Eagle Pass

New Jersey), the Sierra Madre & Pacific, a lumber line, and the Rio Grande Sierra Madre & Pacific, which owned several lines in Sonora and Chihuahua—all rich in agricultural, mineral and forestry resources.

The Parral & Durango Railway was incorporated in Colorado in 1898, and runs from Minas Nuevas Chihuahua, to Paraje Seco, Durango, 59 miles, with a short branch line to Parral. The head offices of this line are at Pittsburgh. The Potosi & Rio Verde, narrow gage, is another American enterprise, with offices at 82 Beaver Street, New York. This runs from San Luis Potosi to Ahuacatal, 38 miles, and is at present under the control of the Mexican government.

Building a Tropical Railroad

It was a Kansas City man, Dennis W. Hedrick, who built the bridges on a line which crosses more rivers and streams than any other railway on the North American continent. This was the Vera Cruz & Pacific line, completed in 1903, and now part of the Mexican government railways, extending from Vera Cruz to Santa Lucrecia, a station on the National Tehuantepec, midway between the Gulf of Mexico and the Pacific. The distance was only 242 miles, but the road crosses six large rivers and numerous streams, which necessi-

tated the building of 300 steel bridges. The largest of these crosses the Papaloapan river at El Hule, the superstructure consisting of five spans, each 170 ft. in length, a draw span of 225 ft. and two steel approaches of 245 ft. each, making a total length of nearly one-third of a mile, and consuming 1,250 tons of steel.

Curiosities of Mexican Railroading

There are a number of reasons, other than those relating to natural obstacles, which make railroad building in Mexico expensive. The peculiarities of the Mexican peon is one of these. During the construction of a line in the south thousands of wheelbarrows which were imported for grading purposes had to be thrown away because the peons would not use them unless permitted to take the wheels off and carry the bodies on their backs.

Government requirements for the construction of new railways have also in the past caused large unnecessary expenditures. When I was traveling on the Mexican Railway from Mexico City to Vera Cruz on May 8 I was informed that the cost of the road had averaged \$136,000 per mile—probably the most expensive railroad in the world—and that while only 264 miles long it had taken 20 years to build the road. A



Bridge Across Balsas River, Mexico

little inquiry soon cleared up the mystery. The government in granting the concession had insisted that the railroad be constructed from both terminals simultaneously. Notwithstanding the vehement protests of the English contractors, they were compelled to transport rails, parts of locomotives and other machinery on mule-back or carts over 250 miles inland, over rugged mountains, some of them over 8,000 ft. high, and then the track had to be laid backwards to meet the section which was working up from the coast.

Some Statistics

That the freight and passenger traffic of Mexico is growing, despite bandit and rebel activities, is evidenced by the statistics of transportation of commodities on the railways under government control—representing only about 8,000 miles—for the year ended June 30, 1918. Here are the figures, in metric tons: Forestry products, 393,968 tons; agricultural products, 1,236,719 tons; animals and animal products, 216,443 tons; inorganic products, such as lime, cement, asphalt, coal and coke, oil, minerals, etc., 1,935,105 tons; general merchandise, 372,475 tons. For a country containing a population of only 14,000,000, of which about 10,000,000 are Indians and half-breeds living under the most extreme primitive conditions, a country which, moreover, has been torn up by nine years of revolutions, these figures are remarkable.

Engineering Council Committee on Compensation for Engineers

THE RAILROAD SECTION of Engineering Council's committee on classification and compensation of engineers has submitted a preliminary report of its activities from which the following abstract will be found of interest to engineers employed by railroads. This section of the committee is composed of Francis Lee Stuart, consulting engineer, New York City, chairman; Frank H. Clark, consulting engineer, New York City and Bion J. Arnold, consulting engineer, Chicago. The work of this committee to date has consisted essentially of the preparation of a questionnaire to be submitted to the chief engineers of railroads, to gather information on compensation being paid to engineers in railway service and opinions on the adequacy of such compensation. It was proposed to have this transmitted through the agency of the Railroad Administration, but Director General Hines did not concur to this view and in consequence the questionnaire has been sent only to members of the "founder societies."

The work of the committee has been divided as follows:

- A. Determining the classes of engineering positions.
- B. Collecting data in regard to compensation now paid for each class.
- C. Determining an equitable rate of compensation for each class.

The committee has adopted a simple general classification containing eight groups which it is believed will be generally applicable to all organizations of engineers.

1. Chief administrative officer having full charge of organization, including determination of policy.
2. Head of major subdivision in responsible charge of large unit.
3. Head of intermediate subdivision in responsible charge.
4. Head of minor subdivision.
5. On general duty under direction but requiring special education and special training and the use of initiative and originality.
6. On subordinate duty requiring special education or training, but not requiring special originality.
7. On subordinate duty not requiring special education, training nor originality.
8. On special duty of responsible character requiring particular qualifications and initiative.

In supplementary remarks issued by the entire committee on classification of Engineering Council considerable information is submitted showing the decreased purchasing power of the dollar and the embarrassing position of the salaried man when compared with wage workers whose compensation has been largely increased by collective bargaining. This statement is concluded by the following:

"The committee believes, therefore, that in adopting standards for the compensation of workers in all technical fields due consideration must be given to the great increase in the cost of living which has taken place. The dollar of salary must be considered with regard to what it will purchase today and is likely to purchase next year, and not with regard to the value of the dollar 10 or 15 years ago. This increase in compensation is necessary not merely as a matter of justice to the engineer, but in order that engineering work may be maintained on the plane that it must be to secure economical and efficient work. Not only the leaders but the rank and file of technical workers often have it in their power largely to affect the cost of the work in their charge by the quality of the effort they exert. There is no economy in paying such men at rates inadequate for their support, for this leaves their minds burdened with anxieties, when they should be free to give their best efforts to the work in hand. Moreover, such a rate automatically tends to drive the abler men into other occupations and to leave in charge of the work only those of less ability, who are unable to make a change."

Corporate Accounting During Federal Control*

Responsibility Rests on the Corporation Accounting Officers to
See that Proper Accounting Is Had With the Administration

By Frank Nay

Vice President and Comptroller, Chicago, Rock Island & Pacific

THE UNITED STATES GOVERNMENT took possession of the railroads of the United States under proclamation of President Woodrow Wilson, at 12 o'clock noon, on December 28, 1917, but for the purposes of accounting, the possession dated from 12 o'clock midnight on December 31, 1917.

Under general orders Nos. 1 and 2, the railroad accounting officers handled both corporate and federal accounts; in fact, at that time they had no knowledge as to the difference between a corporate account and a federal account. They continued, for several months, to perform their duties exactly as prior to federal control. January 1 being the beginning of the calendar year and of the fiscal year established by the Interstate Commerce Commission, was the most propitious day on which to inaugurate the period of federal control. Naturally the accounts for the year 1917 separated themselves from the accounts for the year 1918, barring certain over-lapping items which will be considered later.

Corporate and Federal Accounts

For some months there was indecision as to whether or not it was necessary to make a complete separation of the accounts, such as has since been decided upon. The undersigned was asked by an official of the United States Railroad Administration if he could fairly and impartially keep the accounts of the road which he represented, for the corporation and for the director general, and give a square deal to both. The answer was in the affirmative, and reference was made to the many joint agencies of various kinds existing all over the United States, filled by men who have for years been serving two or more railroad companies, and have been giving each railroad company served, a square deal. However, further consideration of the matter led the Administration officials to the conclusion that it was desirable and necessary to have not only a complete separation of the accounts between the corporate accounts and those of the Administration, but that they should be administered by separate accounting forces, in charge of separate accounting officers; or, to put it another way, the Administration desired to have their accounts kept by men who were 100 per cent Administration, and who had no official connection with the corporations. With this in mind, General Order No. 17 was issued, under date of April 3, 1918. This order provided for a complete separation of the accounts of the corporation from those of the director general, and required that they be written in separate sets of books. This was done, and when the work was completed, the corporate books were turned over to the corporation, and it was then necessary for the corporation to have an accounting officer who would take charge of the corporate books, as the accounting officers of the Administration were prohibited from keeping them further without special permission from the Administration.

Corporate Accounting Departments Organized

About July 1, 1918, the separation of the sheep from the goats began. At that time federal managers were appointed for the various railroads, complete federal organizations were established and the federal officers were required to sever all

connections with the railroad corporations, as officers, directors, or otherwise. That action obliged the corporations to create organizations entirely separate and distinct from the federal organizations. One of the first essentials of the separate corporations was adequate provision for corporate accounting, because it was extremely important that the accounts of the corporation should be given proper attention. As illustrating how the corporate executives felt, I quote the following from a letter dated October 26, 1918, from Mr. Samuel Rea, president of the Pennsylvania, addressed to a number of presidents of other large railroad companies, in connection with the proposed formation of a corporate railway accounting officers' association:

"You will appreciate that the contract is in large part an accounting matter. It lays down the general basis and principles of the relation with the government, but the details for carrying it out will devolve largely upon the accounting officers."

I imagine very few corporate accounting officers at first had any grasp upon the conditions and situations which confronted them. I confess to you that when I was appointed corporate accounting officer, or rather, retained in that position, because no change was made in my title and no change in my duties, except the separation of accounts relieved me from the detail of the operating accounts,—I said to my assistant, something like the following: "Joe, I believe you and I can handle the corporate accounts for the Rock Island; there will not be very many journal vouchers, and we may have to get a clerk or two to work on the subsidiary accounts and check the lap-overs, but you and I can do the general work without any difficulty at all; in fact, I rather welcome the idea of getting a chance to make some entries on the books again; it has been so many years since I actually took my pen in hand to make entries on ledgers."

Today I have in my corporate accounting office for the Rock Island, 34 clerks; they are all kept busy and many of them are working overtime. By actual count we record just as many journal vouchers on our books as prior to federal control. Up to this time I have not personally made any entries on the books and it looks as if I would not be able to do so during federal control; in fact, I give you my word that I have never worked harder in my life than during the last year, and I may add, I have never had less to show for hard work.

In taking up this corporate accounting work, we had an entirely new proposition. None of us had had experience with a similar accounting situation, and we had to blaze the trail. We were also confronted with the difficulty of obtaining adequate and competent help. The very cream of the young railroad men of our country had eagerly offered the supreme sacrifice to help win the war, and there was a great shortage in railroad accountants.

Compilation of Standard Return

One of the first things to which the attention of the corporate accounting officer was applied, was the compilation of data to demonstrate prior to the signing of the contract covering federal control, whether or not the average net railway operating income as reported to the Interstate Commerce Commission for the three years ended June 30, 1917, was the true income for that period. It is assumed that when the

*From an address before the Association of Railway Accounting Officers, New York, June 11, 1919.

President issued his proclamation and when Congress passed the Act of March 21, 1918, fixing as the compensation for the use of the railways, the average annual net railway operating income for the three years ended June 30, 1917, the actual net income as nearly as might be ascertained without completely re-working all of the detailed figures, was intended. In the case of carriers where that net figure was over-stated, due to the omission of some charge or to an excessive credit, which would be adjusted in a subsequent period, unless adjustments are made, such carriers would receive a rental in excess of the amount intended by the President and by Congress. In the case of a carrier whose net income as stated to the Interstate Commerce Commission for the period named, was less than the actual figure, due to items similar to those hereinbefore mentioned, such a carrier would be underpaid unless proper adjustment was made. As the Interstate Commerce Commission was required to certify to the President, the average net railway operating income for the three years ended June 30, 1917, it would seem natural that the Interstate Commerce Commission would make an effort to locate the relatively important items which should be adjusted and thus produce a net figure which would more nearly represent the actual net railway operating income than the one which was reported to the commission.

It should be said right here that when the statement is made that the net operating income reported to the commission, is not the actual, the impression must not be created that any intentional omissions or errors were made or that the net figure that was stated was intentionally greater or less than the actual, but owing to the large volume of items entering into the net operating income of the carrier during the year, or during the three year period, and the complications in connection therewith, it is a practical impossibility to state the net income of the carrier on an actual basis within the time prescribed for rendering the reports.

Along in the summer of 1918, the Interstate Commerce Commission became aware that certain carriers had included in their accounts, subsequent to June 30, 1917, certain Adamson law payments, which accrued prior to June 30, 1917, and should have been charged against the expenses of the three year period ended June 30, 1917. Further, they were aware of the fact that under the income or war tax law of October, 1917, the carriers could not possibly have included the taxes under that law which accrued during the first six months of the year 1917, in the accounts for that period. The very fact that the law was not enacted until more than three months after the close of the period, precludes the possibility of including the figures within the period. Therefore, the Interstate Commerce Commission sent out a communication to the chief accounting officers of the various carriers, requesting them to modify their previous reports of the net railway operating income for the three years ended June 30, 1917, by deducting therefrom such omitted Adamson law payments as had accrued within that period, and also by deducting therefrom one-half of the war taxes under the Act of October, 1917, for the year 1917. This action was commendable and in harmony with the spirit to determine a figure for the net railway operating income for the three years ended June 30, 1917, which should be as nearly as practicable the actual figure for that period. The carriers responded with the corrections requested, and then later, certain carriers called to the attention of the Interstate Commerce Commission items which were erroneously included as a charge against the net income of the test period, and to revenue which was erroneously omitted from that of the test period; the adjustments requested would have the effect of increasing the net railway operating income for the test period. However, the Interstate Commerce Commission declined to make any further adjustments unless it could be shown that the accounting rules of the Interstate Commerce Commission had been violated. The Interstate Commerce Commission initiated the

move to decrease the net railway operating income by deducting therefrom the two items mentioned, the omitted Adamson law payments and the one-half of the 1917 war taxes, neither of which constituted a violation of the accounting rules of the Interstate Commerce Commission, but the commission has so far declined to make adjustment of similar items subsequently brought to their attention.

Lap Overs

Under General Order No. 17, certain items affecting the income accounts of the corporations prior to midnight of December 31, 1917, were classed as lap-overs. On the expense side, these lap-overs were very clearly defined by General Order No. 17, and accounting bulletins and circulars. They referred to all payments by the director general for expenses which were incurred prior to January 1, 1918, which if they had been paid prior to federal control, would have been charged to operating expenses or income account of the corporation prior to such control. In other words, the lap-over expense items were allocated according to the date on which the service was performed or the liability incurred.

The general orders and circulars of the Administration provided that such lap-overs would be paid by the Administration, and charged against the railroad corporations, and that the railroad corporations would simultaneously credit the Administration on the corporate books. This was an entirely equitable method of handling these lap-overs as the Administration had taken over the cash on hand January 1, 1918, and had collected all operating funds accruing to the corporations on and after that date; in fact, the Administration collected all moneys, whether operating or corporate, that accrued to the corporations for several months after the beginning of federal control, and naturally, it was incumbent upon the Administration to pay the liabilities of the corporations.

On the revenue side, however, the lap-overs have not been clearly and equitably defined. In General Order No. 17 it was provided that the Administration would continue to revenue the freight, passenger and other traffic in the same manner that the corporation had accounted for such revenue, taking into the Administration treasury, the revenue that would have accrued to the corporation in the months during federal control. As to passenger service, the revenue on which is accrued largely on a forwarded basis the corporations are credited with more than their proper proportion of the revenue on lap-over passenger traffic. The average journey per passenger is shown in the reports of the Interstate Commerce Commission to be anywhere from 20 miles to 100 miles in the different sections of the United States, and therefore, on the average, because of the short journeys and because passengers do not become congested at terminal points, like freight, the method of determining passenger lap-overs as prescribed in General Order No. 17 does not miss the mark very far, but as heretofore stated, it is not exact, and is on more or less of a hit-or-miss basis. However, neither the revenues of the corporations nor the revenues of the Administration would be seriously affected by the application of General Order No. 17 to the passenger business, assuming that exactly the same method of ticketing passengers and of accounting for passenger revenue will prevail at the end of federal control as at the beginning of federal control.

As to the freight traffic, the method proposed in General Order No. 17 of revenueing freight at the beginning, during and at the end of Federal control, in accordance with the practices of the carrier prior to federal control would cause certain carriers or corporations to suffer heavy losses in their revenues, and the U. S. Railroad Administration to have the advantage of similar gains. At the time that the railroads were taken over by the Administration, freight was interrupted en route and congested at many terminal points. This was due to the increased movement of traffic on account of trans-

portation for the War and Navy departments and by orders given to expedite the movement of certain classes of traffic, which resulted in the delay and congestion of other classes of traffic. In fact, at December 31, 1917, there was an unusual congestion and freight was delayed en route to a much greater extent than in the ordinary course of business, and the accrued earnings on such freight delayed en route, amounted to many millions of dollars. In the case of the few railroads which accrue their freight revenues on the "forwarded" basis, that is to say, those which put into their revenue and income account the earnings when the freight starts on its journey, these congestions would have no effect, but the large majority of roads which accrue their revenue on a "received" basis, that is to say, those which credit their revenue or income account when the freight arrives at destination and the transportation service is complete and the contract fulfilled, would suffer a very large loss of revenue under the provisions of General Order No. 17. Of course, the losses to the corporations would be minimized if the congestion at the close of federal control should be as great as at the beginning of federal control,—a condition which is scarcely possible because at the close of federal control, under peace conditions, there will not be the enormous volume of traffic and priority orders that caused the congestion and delay which existed at the beginning of federal control. However, as to lap-overs, that order was framed on an unsound accounting basis, and provided a hit-or-miss division of the freight revenue between prior or corporation account, and the accounts of the federal Administration. This condition was later modified by the contract, see Section 4, paragraph (b), and by accounting circular No. 53 of December 2, 1918.

The accounting circular No. 53 is still on a hit-or-miss basis, although it does provide for an adjustment of certain delayed carload shipments on which the service was completed prior to federal control but the accounting delayed until during federal control. However, accounting circular No. 53 does not take care of the large number of shipments,—carload and less than carload,—that were delayed in transit on which the service had not been completed at December 31, 1917. Take for example a carload shipment moving from Chicago to Baltimore, which reached Pittsburgh in December, 1917, and lay there until, say January 10, 1918, when it moved out to destination, the settlement being made on the "received" basis. The lines west of Pittsburgh included in their operating expenses, the cost of transporting that shipment from Chicago to Pittsburgh, but never have, and according to the present attitude of the Railroad Administration, never will receive a dollar for such transportation. An offset will result at the end of federal control if a similar car is en route from Chicago to Baltimore, reaches Pittsburgh just prior to the end of federal control and lays there until after the end of federal control, and then moves to destination after federal control, the revenue being taken into the accounts of the corporation after federal control. If a sufficient number of such cars move just prior to the end of federal control, to produce the same lap-over revenue as that produced by delayed cars which moved just prior to the beginning of federal control, there would be an offset, but considering the congestion that existed at the time the railroads were taken over, and that probably there will be no congestion at the end of federal control, it is inconceivable that there will be anything like the number of such cars en route at the end of federal control as at the beginning of federal control. It has been urged that to make a separation of the accounts between the carriers, would require additional clerical expense, and of course, it is true that to prepare an account accurately requires more clerical work than to guess at it. It is my judgment that the railroads as a whole will lose millions of dollars because of the failure to separate the freight revenues at the beginning and at the end of federal control on the

basis of the service performed; that is to say, take the case of the shipment Chicago to Baltimore, hereinbefore referred to; the revenue from Chicago to Pittsburgh should have been credited to the corporation because the expense of that haul was charged to the corporation, and only the revenue from Pittsburgh to Baltimore should have been credited to the federal Administration because the Administration paid the expense of that haul. The increase of 25 per cent in freight rates would require that 80 per cent of the freight that was delayed en route at December 31, 1917, should be delayed en route at the end of federal control; that is to say, where there were 100,000 lap-over cars from certain points to certain points delayed in transit at certain points at December 31, 1917, there should be 80,000 lap-over cars from the same points to the same points, delayed in transit at the same points, at the end of federal control in order to give the corporation an erroneous credit which would offset the erroneous credit given the Railroad Administration at the beginning of federal control. If there should be less than 80 per cent of such cars delayed in transit at the end of federal control, the corporation loses revenue; if there should be more, it will gain revenue, but such methods are unbusinesslike and are not good accounting methods. I daresay that the accounting between the U. S. Railroad Administration and the War department, Navy department, or any other department of the same government, is not conducted on a basis as loose as that.

Of course, as to the less than carload shipments, the average haul is shorter, the amount of money involved is smaller, and the expense of separation is greater. The majority of the less than carload shipments of freight are handled on the "received" basis, while the passenger business is handled on the "forwarded" basis. The less than carload business might be ignored and any loss to the corporation thereon be considered as an offset against the gain in the passenger business. In those two cases, the amount of revenue involved would be comparatively small, and although it is unbusinesslike not to make any attempt at a separation on the basis of service performed, yet accountants must be practical, and where the expense is liable to be more than the amount involved in a separation of accounts between the railroad and the government during the time of war, there would be no serious objection to waiving the strict accounting practices in such cases. However, the expense of apportioning the revenue on carload shipments substantially in accordance with the service performed, would not be seriously burdensome and where millions of dollars are involved, good accounting and businesslike methods should not be sacrificed.

Another question regarding these lap-overs relates to the proper accounts to be charged and credited by the corporation after the amounts have been determined. A bulletin was put out by the Committee on General Accounts of this association, stating that Alexander Wylie, chief examiner of accounts, of the Interstate Commerce Commission, had ruled that these lap-over expenses and lap-over revenues should be charged and credited to the income accounts of the carriers, while a large number of railroad accounting officers maintain that they should be charged and credited to the profit and loss accounts of the carriers. The theory on which the instructions to charge and credit the income account is that if the corporation had been operating the properties, these items would have been taken into the income account under the head of operating expenses, operating revenues, etc. In other words, the decision is based on an "if" statement, but the "if" goes the wrong way. The corporations are not operating their properties and have not operating expenses, operating revenues, etc., in which to include those items. Furthermore, the corporation's income account is based on the average net railway operating income for the test period, which theoretically is complete and represents the

complete income for those three years including the lap-overs from the beginning of the period and excluding the lap-overs at the end of the period. An average of three complete years makes the complete income account so far as the operating accounts included in the standard return are concerned. Hence, any lap-overs added to the income account or deducted therefrom, cause a mis-statement of the income of the corporation.

Another reason for requiring such items to be debited and credited to the income account of the corporation, was to offset the corresponding debit or credit to the income account of the Administration, so that when the two accounts were put together, these lap-over debits to expenses and credits to revenues would disappear in the consolidated account, offsetting each other. However, I have learned recently that it is the intention of the Administration, and I want to express my commendation of their proposed practice, not to charge and credit these items to the Administration income account, but to set up reserve accounts which will take care of similar items that will be charged and credited to the Administration after federal control. It is evident, of course, that at the end of federal control there will be lap-overs in expenses which must be charged back to the federal Administration, and lap-overs in revenues which must be credited back to the Administration. If these items are put into the income account of the Administration currently, it will be necessary for the lap-overs to be put into the income account of the Administration a long time after the close of federal control, which might prove very embarrassing to the Administration because they will run into millions of dollars. It seems to me to be very wise, good business and sound accounting for the Administration to charge and credit these lap-over items to a reserve account against which they will charge and credit similar items after the end of federal control.

Corporate Transactions

Certain debits and credits are made to the corporations by the United States Railroad Administration under the head of "Corporate Transactions." These debits and credits represent payments or receipts by the federal officers which are chargeable or creditable to accounts outside of these comprised in the standard return. Such debits and credits should be carefully examined by the accounting officers to determine whether or not they are properly chargeable or creditable to the corporations, and the principle to govern is whether or not the item is properly chargeable or creditable to an account which is not embraced in the standard return.

Verification of Accounts

One of the principal duties in connection with corporate accounting is to check the debits and credits made against the corporation by the U. S. Railroad Administration, to determine the accuracy of the lap-overs, the charges for additions and betterments, the charges against corporate transactions, and in fact, all debits and credits made against or in favor of the corporation, in order to see that the corporation's revenues and income are properly protected so far as its accounts with the Administration are concerned. Of course, this does not mean that the corporate accounting officer is to neglect in any way whatever his usual functions with regard to strictly corporate transactions which are not handled by the Administration, but this section of the paper is to lay emphasis on the necessity of checking the accounts with the federal administration. Not only should the items which are charged and credited to the corporation be thoroughly audited and their accuracy completely determined, but the accounts of the federal books should be examined with a view of determining whether or not omissions have occurred, which would affect the accounts with the U. S. Railroad Administration.

As to the lap-over items, the principal work will be in the

freight and passenger departments, and that work diminishes as time goes on, because naturally there would be more lap-overs in January, 1918, than in any subsequent month, and so on until the present time, the lap-over items are very small. However, as most of the railroad corporations did not get their corporate accounting departments on a working basis until the latter part of 1918, it is probable that the work of checking the lap-over debits and credits and the accounts to determine whether omissions have occurred, has not been completed to date by very many carriers. For this purpose, first-class accountants should be employees. Any lack of ability on the part of the accountants checking the accounts with the government may result in heavy losses in revenues to the corporation. It is much better to defer the work to some later day than to employ inferior accountants for that kind of work.

Co-operation of Corporate

and Federal Accounting Officers

Throughout this paper, reference has been made to the protection of the revenues of the corporation. This has been done for the reason that the subject assigned to me was "Corporate Accounting during Federal control." The accounts between the U. S. Railroad Administration and the corporations involve hundreds of millions of dollars resulting from transactions which must be recorded on the federal books. Hence, the federal accounting officer is interested in protecting the revenues of the corporations to the extent of seeing that all his accounts with the corporation are recorded with the greatest degree of accuracy. From my personal knowledge of the honesty and fair dealing of the railroad accounting officers of the United States, both federal and corporate, I know that during federal control the federal accounting officers have been diligent and faithful in their efforts to record all transactions with the corporations, with the greatest degree of accuracy and thus to render substantial assistance in protecting the revenues of the corporation. If any federal accounting officer has intentionally deprived the corporation of revenues to which he believed it was justly entitled, whether through erroneous debits or through omission of proper credits, then such accounting officer is unworthy of his profession and is unworthy of membership in this great association, but I will not believe that such an one exists.

Director of Accounts—U. S. Railroad Administration

While in this paper I have criticised a few of the accounting provisions of the Administration, it is not intended to create the impression that I think the Administration has a weak accounting department. On the contrary, I think it has a strong accounting department, administered in its details by men of recognized accounting ability. It would be a miracle if all of the accounting provisions of the Administration were beyond criticism. I also want to pay a tribute to Director C. A. Prouty at the head of the Division of Accounts of the U. S. Railroad Administration, in his administration of that department. The magnitude of his duties prevents him from giving attention to details, but the policy of his administration has been broad and fair-minded.

Conclusion

Many other things could be said with reference to corporate accounting during federal control; this paper has attempted to touch simply a few of the high spots as they appeared to the writer. It would be an insult to the intelligence of the many experienced accounting officers if I should attempt to go into the details and try to touch upon every phase of this subject during federal control. If my paper has resulted in suggesting chains of thought which may be of benefit to the corporations and to the U. S. Railroad Administration, the effort has been amply repaid.

Doings of the United States Railroad Administration

With a Reduced Appropriation the Administration Is Making
Every Effort to Hold Down Expenses and Increase Traffic

WASHINGTON, D. C.

DIRECTOR GENERAL HINES returned to his office on Monday after a speaking and inspection trip to Boston, Denver, Chicago, Omaha, St. Louis and Birmingham. He will also speak before the Philadelphia Chamber of Commerce on Friday and before the New England Bankers' Association at Boston on Saturday. Mr. Hines has stated that he is exceedingly anxious to come into contact with the people of the country as far as it is in his power to do so and to get them to understand the policies which he and his associates are trying to carry out in the Railroad Administration, as well as to seek every practical opportunity to get the point of view of the people as to what the Railroad Administration should do. He is also presenting his views and suggestions as to a permanent solution of the railroad problem and in his speeches takes occasion to explain why he is not yet prepared to decide on a rate increase. In one recent address he said he had had the rather unique experience of having various shippers come to him urging that rates ought to be increased. This he attributed to the fact that "there has been such a striking object lesson that railroad prices have increased to a much greater proportion than the rates have been increased, and therefore that the railroad operations are not likely to be self-sustaining in business with no increase in rates."

Appropriation Is Reduced

The principal effect of the reduction of the Railroad Administration appropriation from \$1,200,000,000 to \$750,000,000 apparently will be in the direction of making it necessary for the Railroad Administration to continue, although to a less extent, the policy forced upon it during the time it has been waiting for an appropriation, of postponing some of its disbursements as long as possible. The estimate of its requirements did not represent contingencies but amounts already expended, contracted for, or to which it stood committed and practically none of the items can be reduced. As soon as the money is made available it will be possible to pay off the certificates of indebtedness, of which \$234,000,000 were outstanding on May 31, and to make additional deferred payments on rental and equipment which were not represented by certificates. Meanwhile its working capital will be somewhat increased and a considerable part of the payments on equipment will not become due until later, by which time it is hoped that they will be financed by an equipment trust, and also pressure will be brought to bear on the corporations to pay what they owe to the government for additions and betterments. The financial situation of the Railroad Administration will then depend largely on the amount of any additional operating deficits and on how fast the corporations are able to finance their indebtedness. The administration officers feel some relief because of the suggestion held out by the House committee that an additional appropriation may be had later and presumably it will follow familiar methods of adjusting its disbursements to its cash on hand until it becomes necessary to ask for more.

From June 2 to July 1, according to an estimate prepared some time ago, the requirements of the railroad companies amount to \$190,850,271. Of this \$113,000,000 was for corporate requirements, \$51,000,000 for maturities, \$23,000,000 for capital expenditures and \$2,962,000 for equipment other than standard.

Contracts Executed

The Railroad Administration has executed a compensation contract with the Illinois Central providing for an an-

nual payment of \$16,540,717 and one with the Yazoo & Mississippi Valley for \$3,862,317; also one with the Bennington & Cheraw for \$29,077. Short line co-operative contracts have been executed with the Boyne City, Gaylord & Alpena; Virginia & Truckee; Tennessee, Alabama & Georgia; Wilmington, Brunswick & Southern and the Loranger, Louisiana & North Eastern.

The War Finance Corporation has made a loan to the Wabash of \$68,000 and to the Seaboard Air Line of \$110,000 on the security of certificates of indebtedness issued by the director general of railroads.

Improvement in Traffic Noted

In the Central Western Region there was an increase in the loading of grain, for the week ended June 9, amounting to 64 per cent over the same week of last year; live stock loadings increased 34 per cent in the same region. Grain loadings in the Northwestern region showed an increase of 100 per cent over last year, while grain products, livestock and miscellaneous freight also showed increases. Passenger travel is on the increase in nearly all the regions and indications are that it will continue to improve.

Reports from the Southwestern region continue to show increases, both in freight loadings and earnings, the increases amounting to 11.1 per cent for the past week. Both the local loading and the cars received from connections show increases. Cotton is moving more freely in this region and with promises of additional steamers for Gulf ports, an increased shipment is expected in an effort to reduce the large surplus on hand.

A summary follows:

Eastern Region.—Reports from nearly all sections still show the general movement of freight and coal traffic to be sub-normal. The blast furnace situation remains about the same, and while the ore movement on the lake is increasing, it is not up to last year's figures. Passenger traffic continues good, and the travel on Decoration Day was extremely heavy, some stations showing largest receipts in history of their companies.

Allegheny Region.—Heavy orders for refrigerator cars have been received through Chicago and Potomac Yards, and special attention is being given to the handling of this equipment. Some slight improvement is noted in the blast furnace situation in Pittsburgh district. The demand for box cars continues heavy, and we are just able to meet requirements.

Pocahontas Region.—Coal dumped at tidewater for the week showed an increase of 50 per cent over the preceding week, although still showing considerable decrease under last year's dumping.

Southern Region.—The cotton movement seems to be increasing throughout the region. The recent fall in prices handicapped planters to the extent that their activities were embarrassed and their purchasing power reduced to the minimum. The recent sharp advance in price, however, has enabled them to recoup their losses, dispose of much of their cotton which they have been holding, and consequently they are in better financial condition, and have again become an element of large purchasing power in the Southern region.

Northwestern Region.—Reports a gradual improvement in the general movement of traffic, particularly merchandise and eastbound tonnage. The loading for the week, how-

ever, showed a decrease of 8,468 cars, consisting principally of coal, coke, lumber and ore. There is a continued improvement in the Pacific Coast Lumber situation. The oil traffic from Wyoming fields continues to show an abnormal increase and the facilities for handling same were taxed to the utmost. The movement of ore for the week shows a decrease of about 15 per cent under corresponding week of last year, but the output of the independent companies is improving and the indications are that the production of ore will be normal in a short time. The movement of freight eastbound is about the same as last year, but the westbound movement is lighter, due chiefly to absence of shipbuilding material and munitions, which moved in large quantities last year, also lighter exports through Puget Sound ports. Passenger business continues to show an increase over last year, particularly pleasure travel. The recent warm weather has greatly stimulated resort and vacation travel, and many requests are being received for reservations.

Central Western Region.—During the week 93,914 cars of all freight were loaded in this region, which was 4 per cent less than the same week of last year. Passenger travel in general continues to be heavier than last year, particularly to Colorado and locally within the state, on account of the inauguration of summary tourist rates. There is also an especially heavy movement at the present time between Kansas City and the new Texas oil fields. Notwithstanding the heavy outbound travel from Southern California, it is reported that the number of people there seems as great as ever, and that hotels and apartment houses are still crowded and unable to accommodate all applicants. Indications are that as soon as means of transportation are available, a large number of foreigners will leave Southern California for their native countries.

Southwestern Region.—Crops in general are in need of warm weather and sunshine, as the rainfall throughout the Southwestern region, especially during the last two weeks of May, caused considerable damage to cotton, wheat, corn and alfalfa hay. Regular passenger travel, both local and through, continues above normal with adequate equipment provided to handle same. The movement of farm hands to harvest fields during the present month will be an item of considerable importance.

Railroad Administration Paying

Little Extra Compensation

Up to June 1 claims for extra compensation had been allowed amounting to \$3,709,887 and an estimate of \$1,500,000 has been used, in figuring the total standard return at \$940,000,000, as a reserve to take care of additions to compensation which may yet be allowed, although the claims pending amounted to \$26,285,000. The total claims filed amounted to about \$69,000,000. The federal control law of March 21, 1918, provides in section 1 that "If the President shall find that the condition of any carrier was during all or a substantial portion of the period of three years ended June 30, 1917, because of non-operation, receivership, or where recent expenditures for additions or improvements or equipment were not fully reflected in the operating railway income of said three years or a substantial portion thereof, or because of any undeveloped or abnormal conditions, so exceptional as to make the basis of earning hereinabove provided for plainly inequitable as a fair measure of just compensation, then the President may make with the carrier such agreement for such amount as just compensation as under the circumstances of the particular case he shall find just."

It is also provided that claims not adjusted may be submitted to boards of referees appointed by the Interstate Commerce Commission. Following is a statement of the disposition of the various claims for extra compensation up to June 1:

STATEMENT SHOWING NAMES OF RAILROAD COMPANIES WHICH HAVE FILED CLAIMS FOR COMPENSATION IN ADDITION TO STANDARD RETURN AND DISPOSITION THEREOF

Recapitulation of claims allowed to June 1, 1919, in excess of standard return:

Baltimore & Ohio	\$2,136,932.00
Chicago, Milwaukee & St. Paul.....	440,082.39
Carolina, Clinchfield & Ohio.....	173,798.41
Northwestern Pacific	172,479.50
Missouri & North Arkansas.....	161,230.00
Kansas City, Mexico & Orient.....	140,926.61

*Baltimore & Ohio allowance includes \$1,724,800 allowed for Toledo & Cincinnati Division, which had no separate standard return, for the reason that during the test period it formed a part of the lines of the Cincinnati, Hamilton & Dayton and made no separate report to the Interstate Commerce Commission.

Georgia & Florida R. R. (including Augusta Southern) ..	116,000.00
Western Pacific	86,229.76
St. Louis Southwestern	67,303.78
Cumberland & Pennsylvania	19,885.50
New York, Susquehanna & Western.....	19,807.00
Wrightsville & Tennille	16,531.21
Salina Northern	15,000.00
Van Buren Bridge Co.....	11,126.47
Louisville & Wadley	2,819.57
Trinity & Brazos Valley (lump sum).....	100,000.00
Gulf, Texas & Western (lump sum).....	29,734.80

Total \$3,709,887.09

Claims denied to June 1, 1919:

New York Central	\$5,339,941.20
Chicago, Rock Island & Pacific.....	5,193,045.34
St. Louis-San Francisco	4,971,520.70
Missouri Pacific	4,383,736.12
Wabash	2,731,368.00
New York, New Haven & Hartford.....	2,000,000.00
Great Northern	1,426,320.00
Erie Railroad	1,397,577.91
Minneapolis & St. Louis.....	1,073,680.75
Lehigh Valley	900,273.98
Boston & Maine	809,624.34
St. Louis Terminal Association Lines.....	696,593.66
Delaware & Hudson	693,861.87
Evansville & Indianapolis	622,504.69
Union Pacific	595,079.00
Cincinnati, Indianapolis & Western.....	529,699.00
Illinois Central	524,736.84
Detroit, Toledo & Ironton.....	512,791.00
Norfolk Southern	476,595.43
Chicago, Indianapolis & Louisville.....	470,808.12
Northern Pacific	437,579.28
Chicago, Terre Haute & Southeastern.....	392,856.95
Louisville & Nashville.....	341,776.40
Norfolk & Western	189,700.09
Pullman Co.	160,000.00
New Orleans Great Northern.....	153,192.21
Philadelphia & Reading	128,059.50
Gulf & Ship Island	124,908.00
Waterloo, Cedar Falls & Northern.....	123,410.94
Louisiana & Arkansas	120,695.30
Toledo, Peoria & Western.....	120,260.23
Ann Arbor	109,721.01
Bangor & Aroostook	107,170.24
Hudson & Manhattan	89,224.00
Minneapolis, St. Paul & Sault Ste. Marie.....	86,084.99
Port Townsend & Puget Sound.....	74,863.06
Ulster & Delaware	71,722.32
Lehigh & New England	57,520.45
Kansas City Southern	57,447.11
Toledo Terminal	47,000.57
Port Reading	42,289.86
Galveston Wharf Co.	32,479.41
Detroit, Bay City & Western.....	18,000.00
Wildwood & Delaware Bay.....	15,562.75
Galveston, Houston & Henderson.....	9,458.00
Catasauqua & Fogelsville.....	8,107.52
Piedmont & Northern	2,605.23
Atlantic City Railroad.....	642.81

Total \$38,474,095.21

Claims withdrawn to June 1, 1919:

Chicago Great Western	\$171,513.49
Elgin, Joliet & Eastern	115,756.01
Nashville, Chattanooga & St. Louis.....	78,230.47
Farmers Grain & Shipping Co.....	53,647.33
Atlantic Coast Line	44,361.84
Ocean Steamship Co.	43,818.97
Central of Georgia	39,468.09

Total \$546,796.10

Claims pending June 1, 1919:†

† Amount not stated in claims of Toledo, St. Louis & Western, Gulf, Mobile & Northern, Lake Superior & Ishpeming Ry. Co., Old Dominion Steamship Co., Old Dominion Terminal Co., and Virginia Navigation Co.

Missouri, Kansas & Texas System (3 claims).....	\$5,559,539.61
Southern	4,771,398.97
Wheeling & Lake Erie	2,828,314.63
New York, Chicago & St. Louis.....	2,732,941.09
Seaboard Air Line	2,538,726.00
Western Maryland	1,883,478.94
Gulf Coast Lines	1,487,722.75
New York Connecting	1,469,758.80
Chicago & Alton	926,685.08
Florida East Coast	672,804.71
Chicago & Eastern Illinois.....	414,159.12
Missouri, Oklahoma & Gulf (approximate).....	211,480.00
Fort Dodge, Des Moines & Southern.....	154,164.39
Atlanta, Birmingham & Atlantic.....	134,823.16
International & Great Northern.....	129,259.18

Houston & Brazos Valley.....	102,733.00
Pittsburgh & Shawmut.....	157,302.81
Escanaba & Lake Superior.....	46,311.99
Pacific Coast.....	35,222.28
Vicksburg, Shreveport & Pacific.....	28,780.00
Total	\$26,285,606.51
Claims denied and now pending before the Interstate Commerce Commission board of referees:	
Boston, New York & Cape Cod Canal.....	\$495,644.04
San Antonio, Uvalde & Gulf.....	216,054.32
Midland Valley	87,145.13
Total	\$798,843.49

Director General Appeals for Efficiency and Economy

Walker D. Hines, director general of railroads, has sent the following letter to all officers and employees of railroads under federal control:

"The increased payroll cost, due to improved wages and working conditions, and the increased cost of material and supplies, are now resulting, in connection with the falling off in business, in the United States Railroad Administration incurring heavy deficits in railroad operations.

"For the first four months of this year, these deficits, after deducting the rental due the railroad company, were about \$250,000,000 or at the rate of \$62,500,000 per month. This critical condition makes it imperative not only that costs shall not increase but also that every effort be made to help the government through every reasonable effort to economize and realize greater efficiency.

"These deficits, so far as they cannot be eliminated through greater economies and through increased business, will eventually have to be offset by increased transportation rates which all should endeavor to avoid.

"I ask every officer and every employee to redouble his efforts to do efficient work, to economize in the use of railroad materials, fuel and other supplies, and to use great care not to injure equipment, tools, office furniture or injure property being transported by the railroad and for which payment must be made if injury occurs, and further than this, to try to encourage others to do the same. Please remember that if you should fail in any of these respects to do what you reasonably could and ought to do you would impose unnecessary cost upon the government. This is true because it is the government which has to bear the loss if there is one or which will receive the profit if any is earned.

"Do not wait for the other fellow to begin this improvement, but begin yourself. Do not decline to help because some other fellow is not helping; turn in and help, and keep on setting the other fellow a good example. You are interested in the great movement for the improvement of the condition of the individual worker. You can aid in that great movement, through efficiency and saving in reducing the cost of railroad operation, because thereby you help to keep down transportation rates, and thereby you help to keep down the cost of living. An increase in rates will give occasion for an increase in prices of what the public consumes and that will mean a new cycle of increasing still further the cost of living. It is to the interest of every man, woman and child in this country that this shall be avoided just as far as possible.

"The government, during federal operation of the railroads, as a result of its nation-wide control, has been able to do much to promote justice to railroad employees through making proper increases in their wages and proper improvement in their working conditions. In the nature of things the result cannot be equally satisfactory to all, involving 2,000,000 employees, because it is not possible in this vast undertaking to satisfy equally every one or even every class of these employees. If any employee feels he has a ground for such dissatisfaction he ought to remember the remarkable strides that have been taken by the government in the last 12 months in the recognition of the just rights of railroad employees, and compare the situation today with what it was in December, 1917, before federal control began. It has been a

source of satisfaction to me to aid in this great work. Will you not, in turn, do justice to the government and help sustain my work, as director general, and also justify what has been done for you, by doing all that you can reasonably do to save the government money and to increase the efficiency of your work?

"I sincerely want your assistance in demonstrating that the railroads may be operated successfully even though the wages of its employees have been materially increased."

Report on Fort Washington Collision

THE INTERSTATE COMMERCE COMMISSION has issued a report, dated April 10, signed W. P. Borland, chief of the Bureau of Safety, on the rear collision on the Philadelphia & Reading near Fort Washington, Pa., January 13, 1919, which resulted in the death of 14 persons and in the injury of 22.

This collision was reported in the *Railway Age* of January 17, page 212, the accident having happened in the same week with that at South Byron, N. Y.; also in the monthly record printed in the *Railway Age* of February 28, page 510.

While the principal cause was the failure of the engineman of train 319 to observe the adverse indication of a distant automatic block signal, the report brings out other elements. The signals are enclosed disks, and the distant signal is not controlled by the position of the home signal; it is controlled directly by the track circuits of the two block sections in advance. The engine had two cabs, the engineman's cab being located ahead of the firebox and about the center of the locomotive. The colliding train, No. 319, was running at moderate speed, but the engine, weighing 98 tons, penetrated the wooden passenger car at the rear of the standing train about 45 feet. None of the cars in either train were derailed.

A test of the brakes on train 319 developed that the engine had no brakes on the engine truck, and that the piston travel on the tender was too great, so that the brake apparatus of the engine and tender, as a whole, was weak.

The flagman went back only about 1,500 ft. and there stood from 3 to 5 minutes before the approach of the following train; by going a short distance farther he would have made his signal visible beyond the abutment of an overhead bridge.

The report recounts very careful inspection of the signal apparatus, leading to the conclusion that the possibility of any abnormal condition existing in the distant signal, which would be necessary to justify the engineman's claim that he saw a clear signal, is exceedingly remote. The engineman declared that about six weeks prior to this collision he had found this distant signal clear when the next succeeding home signal was at stop; but from testimony of the signal maintainer it appears that the distant signal, in indicating clear, was in proper position, and that the wrong position of the home signal was due to local circuit trouble in the clearing relay. Though the home signal indicated stop, the section was in fact clear.

The engineman at fault is 39 years old; was employed as fireman in 1907 and promoted to engineman in 1913. In February, 1918, on account of unsatisfactory service he was put back to firing; and was restored to the position of engineman twelve days later. Since then two other adverse items appear on his discipline record. The flagman is 35 years old, and had been in the service 13 years; was a freight train conductor for one year.

Fifty miles in 26 minutes, 23.2 seconds is the latest speed record reported in an automobile race. This record was made at Sheepshead Bay, New York City, on June 14, by Ralph De Palma. It is equal to 113.7 miles an hour.

Convention of the Telegraph Superintendents

Mailgram Service, Wire Crossings and Pole Line Construction Among Important Subjects Considered

THE TELEGRAPH AND TELEPHONE division of "Section 1—Operating," of the American Railroad Association, held its first annual meeting at the La Salle Hotel, Chicago, June 11, 12 and 13. This division of the A. R. A. was formerly the Association of Railway Telegraph Superintendents and this was the thirty-seventh meeting of the former association. M. H. Clapp, manager of the Telegraph section of the United States Railroad Administration and chairman of the division, presided, and the total registration was about 180. The chairman said that although the reorganization was intended to be only for the duration of the Railroad Administration he felt that it was for the best interests of the members that the amalgamation be permanent. He said that reports presented were to be divided into two groups consisting of those ready for final adoption and those of a preliminary nature. He made a plea for co-operation in and between different departments, railroad companies and commercial companies.

R. H. Aishton, regional director the Northwestern region, United States Railroad Administration, made a short address Thursday morning. He referred to the wonderful progress that had been made by the association in the past. In 1908 the only telephone circuit for train despatching in use was one 45 miles long on the Chicago, Burlington & Quincy, while at the present time there are 13,440 miles of such circuits. He was a great believer in association work and favored amalgamation with the American Railroad Association; the railroads will of necessity have to look to somebody to keep them from being foolish after their return to private operation. No railroad would be foolish enough to go against recommendations of such a body as the American Railroad Association. What is accomplished by the association will in the course of the next four or five years come very close to being railroad law. If the roads go back to private operation at the end of the year it will be under changed and better conditions and greater progress will be made during the next few years than ever before.

A banquet was given for the members of the association on Thursday evening at the La Salle Hotel under the auspices of the Railroad Telegraph and Telephone Appliance Association. The speakers were E. E. Nash (C. & N. W.); C. Selden (B. & O.); G. A. Cellar (Pennsylvania Lines West), and H. Hulatt (Grand Trunk).

Committee Reports

Sub-Committee A,—Maintenance and Construction of Pole Lines of committee No. 1—Construction and Maintenance, Outside Plant, presented a preliminary draft of pole line specifications including 15 of the proposed 16 sections but in general without the official drawings and without certain appendices yet to be decided upon. A plan for pole line specifications involving complete independence of any other organization or company was presented at the meeting held in Chicago last December. It was decided, however, to develop through joint action if possible uniform specifications satisfactory to both railroad and telegraph interests and this report was made upon this basis. The specifications provide for three grades of line according to the character of circuits carried, viz., special trunk lines, trunk lines, and non-trunk lines. Trunk lines are described as all pole lines carrying trunk and other important circuits; special trunk lines are defined as special pole lines connecting important centers. Non-trunk lines are all other pole lines.

The specifications also divide the country into four pole-line districts determined by the severity of the climatic conditions which are designated as extra heavy, heavy, medium and light, respectively. The various grades of the lines to be built under these specifications are to be fitted to climatic conditions. The committee asked approval of the plans submitted and for further instructions.

E. C. Keenan, general superintendent telegraph, New York Central, pointed out the advisability of the committee establishing a set of specifications based on engineering principles and offered an amendment to the original motion to the effect that the committee should continue along lines consistent with principles heretofore adopted by the Association of Railway Telegraph Superintendents. He proposed changes in certain tables.

William Bennett (C. & N. W.) felt that it was unnecessary for the committee to follow engineering principles in pole line construction as strictly as for other items of railroad construction; railroads could operate temporarily notwithstanding failure of pole lines.

E. A. Chenery, general superintendent telegraph Southwestern region, United States Railroad Administration, stated that under the present specification a mile of 41 Class B 22-ft. chestnut poles carrying 40 wires would cost \$1,355 which is considered a pretty good pole line, compared to practice 10 or 20 years ago when 30 to 35 poles per mile was common practice. Comparing these figures with the proposed specifications for pole lines in extra heavy districts, the cost would be \$1,327 to \$2,419, the lower figure being for non-trunk lines. A mile of pole line in extra heavy districts would cost from \$1,951 to \$2,419 or from 41 to 80 per cent more than the same line built under present specifications. Every railroad has some mileage so unimportant that a 50 per cent increase in the cost of construction is not justified. The report was accepted by the association as a progress report.

Wire Crossings

The report of sub-committee B,—Wire Crossings, Committee No. 1 Construction and Maintenance, Outside Plant, contained recommendations covering wire lines crossing over railways. Dr. M. G. Lloyd of the Bureau of Standards requested the association to criticize the Bureau of Standards' proposed revision covering such crossings. This revision was considered at committee meetings and the sub-committee conferred with Edwin B. Katte, representing the Committee on Electric Working of the A. R. A. and the Committee on Electricity of the American Railway Engineering Association, who concurred in the recommendations of the sub-committee as presented here. In the proposed revision the Bureau of Standards wished to have the rules governing signal line crossings over railways based upon engineering principles with proper assumed loading so as to be consistent with other sections of the Safety Code. While the proposed revision as shown by the first draft is generally based upon scientific principles it contains some articles which in the opinion of the committee were not consistent with good railroad engineering practice and changes were proposed. After the Bureau of Standards finally issues its revision it is the purpose of the sub-committee to get up detailed specifications for wire crossings over railroads as well as parallels or conflicts between signal lines and power lines. The association instructed the committee to proceed

along the lines on which it was working with the understanding that it follow the engineering practice of the Bureau of Standards.

Underground Construction and Transpositions

Sub Committee C.—Underground Construction, Committee No. 1, Construction and Maintenance, Outside Plant, reported on a revision of the draft of the specifications which appeared in the proceedings of the meeting held in Chicago last December. The specifications presented at this meeting prescribed the general requirements for underground conduit construction for telegraph, telephone and other low voltage signal cables on railroad right-of-way. The specifications covered conduit construction, general specifications, high and low tension ducts in the same trench, location and clearances, manholes and handholes, and material. The report was adopted as recommended practice.

Sub-Committee D. Transportations, Committee No. 1, Construction and Maintenance, Outside Plant, submitted complete specifications for locating and installing transpositions in telephone circuits. The specifications were accompanied by numerous transposition diagrams for standard auxiliary and unit sections showing non-phantom, horizontal phantom and vertical phantom transpositions. The specifications cover the creating of both physical and phantom telephone circuits and provide a method for transposing these circuits so as to reduce inductive disturbances from neighboring circuits. These specifications follow those of the American Telephone & Telegraph Company and the Western Union Telegraph Company. It is the intention of the sub-committee during the coming year to prepare specifications for the line materials which are referred to in these specifications.

The question was asked whether the telegraph wires should be placed above or below telephone circuits and as to where the ticker circuits and signal circuits should be placed on the pole line. In answer the chairman of the sub-committee said there was no preferred position as regards the telegraph and telephone circuit but that the ticker circuit should be on an end pin on the top cross arm in order to be as far removed from inductive disturbances as possible. When signal circuits were carried on the same pole line with the telephone and telegraph circuits the signal circuits should be on the lower cross arm.

Report on Office Wiring and Equipment

Committee No. 2, Construction and Maintenance, Inside Plant, submitted a preliminary draft of specifications for the installation of telegraph and telephone equipment in railroad offices. The report was accepted as a progress report.

Reports on Electrolysis and Lighting Protection

Committee No. 3—Protection Against Electrolysis, presented a report which consisted of a general discussion of electrolysis as affecting telegraph and telephone conductor cables, its nature, causes and remedies with descriptions of instruments for making electrolytic tests and instructions concerning the use of such instruments. Certain specific maintenance instructions were also given. The report was accepted as recommended practice.

Committee No. 4 submitted a report on Protection Against Lightning and Against Electric Light and Power Circuits in the form of a preliminary draft of specifications for such protection. The committee felt that it was necessary to differentiate between wires owned by railroad companies and those not owned. During the discussion some members felt that the railroad companies should specify the protection to be used on all lines entering railroad company buildings irrespective of whether they were owned by the company or not. Others felt that specifications should not be carried that far as the larger telegraph and telephone companies

have their own specifications which may be presumed to be safe. Some felt that hazard to life had been given secondary consideration and property hazard first. The report was accepted as showing work accomplished to date.

Committee No. 5—Telegraph and Telephone Development, presented a report upon a number of recent improvements which was accepted as information.

Messages and Mailgrams

Committee No. 6—Message Traffic, reported in part as follows: "Assuming that many communications have been offered for transmission by wire which would have served their purpose equally well if handled by mail, we are confronted with the proposition of establishing a dividing line between message traffic and mail traffic."

The committee recommended that the railroads generally be asked to instruct all persons originating telegrams and correspondence to offer for transmission by wire only communications which require attention prior to the time such attention would be given if forwarded by mail or where the transmission by wire will mean a considerable money saving. A mailgram service could be established to advantage on practically all railroads. "Mailgrams" should be placed in a pouch in the telegraph office and, immediately before the departure of train, a special messenger should be sent to the train with the pouch, delivering it to the train baggageman. At destination a telegraph office messenger meets the train and takes the pouch to the telegraph office, from which point the messages are delivered the same as telegrams. On some railroads special forms of envelopes, or envelopes specially stamped, are kept open in the telegraph office until immediately before the departure of a train on which such telegrams can be carried as mail.

The rest of the report discussed censoring, filing time, adequate address, use of symbols and codes. These items were referred back to the committee for further consideration.

Regulations Governing Telegraph

and Telephone Division

The regulations as drawn up by the Committee of Direction for the Telegraph and Telephone division Section 1, Operating, were presented to the meeting and they were adopted. The regulations provide:

1. Representatives of members shall be those actively connected in official or supervisory capacities with railroad telegraph or telephone service, who have general charge of such service over an entire railroad or grand division of a railroad consisting of two or more transportation divisions. A reasonable number of such other employees in supervisory capacities as may, from time to time be presented by the railroads for reasons special to themselves, or as may be called by the Telegraph and Telephone division for special duties may be designated as temporary representatives of members.

2. The Committee of Direction consists of eleven representatives of members within the division, including the chairman and the first and second vice-chairman of the division, the two past chairmen of the division last holding office, and six representatives of members; and a committee on Nominations of five members to be elected annually by the division.

The Committee of Direction shall conduct the business of the division and fix the number of and appoint the members of committees. For the present there shall be the following:

Committee No. 1—Construction and Maintenance—Outside Plant.
Committee No. 2—Construction and Maintenance—Inside Plant.
Committee No. 3—Protection Against Electrolysis.
Committee No. 4—Protection Against Lightning or Electric Light and Power Circuits.
Committee No. 5—Telegraph and Telephone Development.
Committee No. 6—Message Traffic.
Committee No. 7—Editing.

3. Regular meetings of the Committee of Direction shall

be held quarterly, and regular meetings of the division in March and September. The September meeting shall be the annual session. Special meetings may be held at the call of the Committee of Direction.

4. The Committee of Direction shall offer the names of ten representatives of members, not officers of the division, as candidates for the committee on nominations.

5. Defines duties of the Committee on Nominations.

6. Officers shall be elected at the annual meeting. The chairman, the first and second vice-chairman and members of the Committee of Direction and the Committee on Nominations shall be elected by printed ballot each year, the candidates receiving the majority of the votes cast shall be declared elected and shall hold office for one year or until their successors shall be elected.

7. The right to hold office, vote and attend executive sessions shall be vested in representatives of members only.

Election of Officers

Martin H. Clapp, manager Telegraph section United States Railroad Administration, was elected chairman; J. F. Caskey, superintendent telegraphs, Lehigh Valley, first vice-chairman; H. Hulatt, manager of telegraphs, Grand Trunk Railway System, second vice-chairman. The secretary of the telegraph section is J. E. Fairbanks, 75 Church street, New York. The members elected on the Committee of Direction were: G. A. Cellar, superintendent telegraph, Pennsylvania Lines West; E. A. Chenery, general superintendent telegraph on Southwestern region, United States Railroad Administration; W. H. Hall, superintendent of telegraph, Missouri, Kansas & Texas Lines of Texas; C. S. Rhoads, superintendent telegraph, Cleveland, Cincinnati, Chicago & St. Louis; L. S. Wells, superintendent of telegraph and electricity, Long Island Railroad, and F. T. Wilber, superintendent of telegraph, Illinois Central. In addition E. C. Keenan, general superintendent of telegraph and telephone, Eastern region, United States Railroad Administration, and William Bennett, superintendent of telegraph, Chicago & Northwestern.

The Appliance Association Elects Officers

The Railway Telegraph and Telephone Appliance Association at its annual meeting at Chicago on June 12, re-elected the following officers: A. D. Walters, New York Telephone Company, New York, chairman; G. A. Graber, Kerite Insulated Wire & Cable Company, Chicago, vice-chairman; G. A. Nelson, Waterbury Battery Company, New York, secretary-treasurer. The executive committee of the association also remains unchanged.

Orders of Regional Directors

FREIGHT CAR DISTRIBUTION.—The regional director, Eastern Region, by a circular, dated June 12, issues revised instructions for sending freight cars towards home. System cars will be confined to local loading to the fullest extent practicable and will not be furnished for off-line loading if other suitable equipment is available. In filling orders for off-line loading, special effort should be made to furnish equipment for loading to or in the direction of: (a) the car owner; (b) the Regional territory in which car is home; (c) to an intermediate connection in the direction of car owner or Regional territory in which car is home; (d) locally in the direction of car owner or Regional territory in which car is home. In furnishing empty cars on Inter-Regional or Regional orders, care will be exercised to furnish to fullest extent possible cars owned by: (a) the receiving road or roads; (b) the receiving Regional territory in which car is home.

Superheaters.—A. T. Hardin, regional director, Eastern Region, by circular 500-1-97A728A promulgates for the information of federal managers the order of the director of the Division of Capital Expenditures relative to the application of superheaters to locomotives. The order says: "Consideration by the Mechanical Section of the Division of Operation develops that these superheaters will not pay for the cost of application, irrespective of the cost of the material, if the engine is not actually in service by October 1, 1919. It is of course expected that business judgment will be exercised in installing the superheater even after that date, but unless the corporations are willing to stand the operating charge as well as the capital charge for applying superheaters after October 1, 1919, the program should cease as of that date."

New Locomotives Moved Free.—The regional director, Eastern Region, by circular 500-1-106-A783, advises that no freight charges are to be assessed on any class of new locomotives moving from the works of the builders to the purchasing roads, whether under their own steam or dead in trains.

Label Holders for Express Cars.—The regional director, Eastern Region, by circular 500-104A784, recommends that all cars used in express service be fitted with two holders, one on each side, for the labels used by the express company. A standard label, six inches by nine inches has been adopted, and the circular shows a drawing of a metal holder suitable for this size label. It can be made of sheet metal or of cast iron. The holder should be near enough to the door to permit of being reached by a person standing inside, and with the center of the holder about six feet above the rail.

Per Diem Settlement.—Supplement 4 to Circular 78 of the Northwestern regional director amplifies instructions contained in Supplement 3 to Circular 78 (*Railway Age*, page 1202, May 16) regarding per diem settlements with non-federal controlled roads. A similar order has also been issued by the Southwestern regional director.

Shipments of Nut and Bean Oil.—Order 212 of the Southwestern regional director states that shipments of nut and bean oils are being made in barrels and other wooden containers which are not of sufficient strength to prevent leakage and instructs all concerned to apply rules making it permissible to decline freight unless shipped in containers of sufficient strength to afford reasonable protection.

Movement of Oil and Tank Cars.—Order 211 of the Southwestern regional director amends Circular 72 issued on April 9, 1918, by Regional Director R. H. Aishton to all western railroads in that roads in the Southwestern Region may symbol, report and handle as trainload 20 or more cars of oil for one destination instead of the 25 cars stipulated as the minimum for the movement of oil in train lots in the original order. All trains may be filled out with other traffic when practicable and where it can be done without unreasonable delay. In any case where the engine rating is less than the tonnage of 20 cars of oil, then the full engine rating of oil tonnage will be considered a trainload of oil.

Routing Instructions for Eastbound Carload Freight.—Routing Circular 103A-Chicago, superseding Routing Circulars 101, 102, 103 and 104, issued by J. E. Weller, resident traffic assistant, Allegheny Region, Chicago, outlines routing instructions for eastbound carload freight including fresh meat, live-stock, perishables, grain, grain products and dead freight originating in Chicago districts and west, when destined to the Allegheny or neutral territory. These routing instructions are not to apply when in conflict with current embargoes.

Atlantic City Convention.—Hale Holden, regional director of the Central Western Region, in a letter dated June 6, to federal and general managers of Central Western railroads, issues similar instructions to those contained in Circular

lar 131-75A731A of the Eastern regional director (*Railway Age*, June 13, page 1438).

Notifying Consignee of Arrival of Freight.—Supplement 1 to Circular 74 of the Northwestern regional director states that freight waybills do not ordinarily show the street address of consignee and that notice of freight arrivals, where street address is not shown, should be given by sealed letters rather than by postal cards in cities where mail is delivered by carriers because of the fact that postal card notices which do not show street addresses are not delivered, whereas sealed letters without street addresses are delivered when the city directory shows the location of person addressed.

Forage Consigned to Army Camps.—The Northwestern regional director, file 73-1-83, amends orders issued in a circular dated February 14, (*Railway Age*, February 21, page 444), relative to the weighing of shipments of forage consigned to army camps. The Southwestern regional director issues similar amendments in Supplement 1 to Order 165.

Cotton Shipments to Southern Points.—Circular 221 of the Southwestern regional director outlines instructions issued by the regional director of the Southern Region relative to the shipment of cotton originating at points west of Chattanooga, Tenn., Birmingham and Montgomery, Ala., and Pensacola, Fla., and destined to Jacksonville, Fla., Brunswick, Ga., Savannah, Ga., Charleston, S. C., Wilmington, N. C., proper or for export through these points unless shipments are covered by transportation orders issued by the Inland Traffic Service or by permits issued by the Southern Export Committee, Atlanta, Ga., and requests that cotton restricted by this circular be refused for shipment unless covered by the proper authority.

Flexible Staybolts.—Northwestern Regional Purchasing Committee Bulletin 146 states that the American Locomotive Company has completed the installation of equipment necessary for the manufacture of flexible staybolts and will prepare to furnish them upon order.

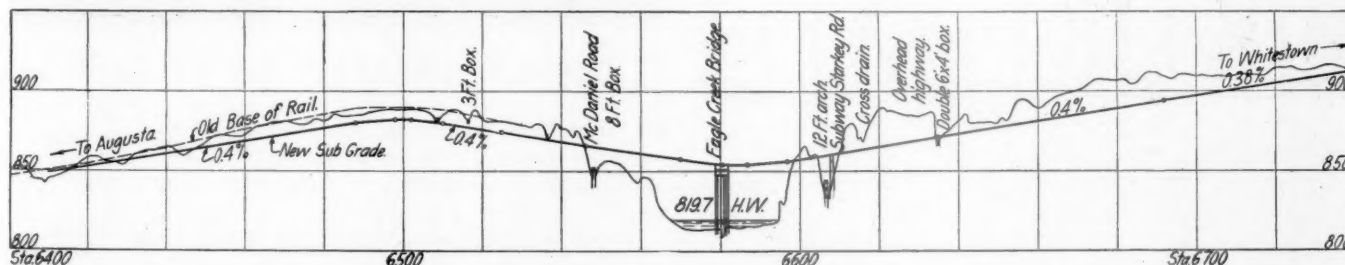
Big Four Increases Capacity At Congested Points

Builds 87 Miles of Second Track and Reduces Grades to Handle More Traffic During War Period

AN INCREASE IN TRAFFIC density on the Cleveland, Cincinnati, Chicago & St. Louis during the war period made it necessary to provide additional facilities, particularly second main tracks. As a consequence the construction of 87 miles of second track was undertaken during 1917 and 1918, nearly all of which is now in service. The largest part of this is on the Cleveland-St. Louis line, the backbone on the Big Four system. Later, work was also undertaken on the Chicago-Cincinnati line and on a short stretch at Columbus, Ohio, in connection with terminal improvements at that place. Considerable improvement in grade was undertaken in connection with the second track work, but, as explained later, the conditions did not warrant a complete change in ruling gradients on any of the

Marion, Ohio to Cleveland 101.5 miles. Of this last stretch the 21 miles between Marion and Galion consists of the parallel, single-track lines of the Big Four and the Erie which are operated as joint double track. The 284 miles of line between Cleveland and Indianapolis is operated as two engine districts; one of 141 miles from Cleveland to Bellefontaine and one of 143 miles from Bellefontaine to Indianapolis. The ruling grade in both districts is 0.8 per cent in both directions. The present improvements include 18.6 miles of second track between Ansonia, Ohio and Winchester, Indiana, and 44.6 miles between Gretna, Ohio and Marion, work on which has been in progress since the latter part of 1917.

All of this work is being conducted in conformity with a



Profile of the Zionsville Cut-Off North of Indianapolis

engine districts. In only one case was it found necessary to make a deviation from the existing alinement.

The Cleveland-Indianapolis Line

All of the improvement work on the Cleveland-St. Louis line is east of Indianapolis. This is the busiest section of the road. The traffic amounts to about six passenger and seven scheduled freight trains each way daily, in addition to extras. During 1916 the gross tonnage handled amounted to 8,782,000 ton miles per mile of road while the train movements aggregated 6,800 freight and 5,700 passenger train miles per mile of road. Previous to the inception of the present project double track had been in operation on this line between Indianapolis and Taft 32.9 miles, and from

program for reducing the ruling grade in both directions to 0.3 per cent, with the exception of that portion of the line crossing a summit about four miles east of Bellefontaine where the track reaches an elevation of about 1350 ft. above sea level, one of the highest points in the state of Ohio. The two approaches to this summit cover practically the entire distance of 25 miles from DeGraff, at elevation 1000, to Ridgeway, at elevation 1060, and entails the use of 0.8 per cent grades which could not be eliminated on the present location, without an objectionable increase in distance. It would be possible to build a line several miles to the north of the present location which would largely avoid this summit, but such a line would miss the city of Bellefontaine and involve the abandonment of the engine and freight ter-

operated track. After this had been done, a track was laid and put in service on the new embankment which was then widened to the standard width. The shoulder for the temporary track and the first portion of the high embankment were made with teams from borrow pits along side having a maximum depth of 15 ft. A steam shovel was also used



Contractors Plant at the Eagle Creek Bridge

in this pit to supply material for completing this embankment after the track had been installed on the top and for widening embankments at other points in the section. All filling handled by the shovel was hauled in standard-gage equipment over the operated track. The bridge work on this section was of minor importance, the only structure of any size being an existing undercrossing used by an electric line. This had to be largely reconstructed to provide for the second track and a raise of seven feet in the grade line. Aside from the extension of the abutments and the raising of the grade, the single-track, deck girder span was replaced by a reinforced concrete slab.

One of the points of chief interest attached to this section of the work arose from difficulties encountered with sink holes. At several places east of Union City, the bottoms

filling without effecting much progress in the completion of the work. This difficulty was finally overcome by discontinuing the use of a heavy clay filling in favor of cinders, which, being much lighter and not being subject to the flowing which took place in the clay, did not disturb the equilibrium of the subsurface materials to any great extent. A more complete account of the experience with these sink holes was published in the *Railway Age* of January 17, 1919, page 217. All of the grading on the Cleveland divi-



Building a Drainage Diversion Ditch Alongside the Eagle Creek Embankment

sion was done by the Walsh Construction Company, Davenport, Iowa.

Heavy Work Near Indianapolis

By far the heaviest and most interesting feature of all the improvement work undertaken by the Big Four is the double track work between Augusta and Whitestown, a short distance north of Indianapolis. This improvement covers 10.2 miles of which 4.5 miles is on a new location known as the Zionsville cut-off. This constitutes an extension of sec-



The Embankment in the Eagle Creek Bottoms

of depressions traversed by the railroad are underlaid with a stratum of peaty loam of varying thicknesses. In three locations this was so thick that the weight of the newly imposed embankment squeezed it out along each side and pronounced and protracted settlements occurred, accompanied by extensive upheavals of the adjacent ground surface. As a consequence large quantities of material were placed in the

ond track on the Indianapolis-Chicago line which had previously extended from Indianapolis to Augusta, a distance of 10.8 miles. It also affords a considerable improvement in grade and alinement. The old line has grades of 0.78 per cent southbound and 0.67 per cent northbound, whereas the new line has maximum grades of 0.4 per cent in each direction conforming to the adopted ruling grade between

Indianapolis and Kankakee, Ill. The maximum rate of curvature on the old line is 2 deg. 37 min. with a total central angle of 75 deg. 56 min. whereas the new line now has a maximum rate of curvature of 0 deg. 30 min. with a total central angle of 34 deg. 50 min. The saving in distance on the new line is important, amounting to 2,500 ft. or nearly one-half mile. A total of 586,000 cu. yd. of earth work in excavation is involved.

On the basis of its physical features this project is naturally divided into four sections. At the south end is 3.2 miles of second-track work on the old alignment, the most important feature of which is an 11,530 ft. grade reduction involving a depression below the existing grade to a depth of 8 ft. and requiring the removal of 189,000 cu. yd. of material. This total includes a 2,000-ft. continuation of this cut on to the south end of the cut-off. The cut-off embraces two essential features, an embankment a mile long and 40 ft. high across the Eagle Creek valley containing 478,000 cu. yd. and a cut $2\frac{1}{2}$ miles long containing 397,000 cu. yd. The remainder of the work including 2,300 ft. of the cut-off

in the north cut moving without interference entails a carefully planned and extensive track layout as indicated by the use of 7 miles of temporary track in the $4\frac{1}{2}$ miles of cut-off.

One noteworthy feature of this work is the special pains taken to obtain adequate drainage as well as freedom from washing of the cut and embankment slopes. Cuts were given a sub-grade width of 10 ft. from the center line of track plus a minimum of 5 ft. for a ditch, this ditch being increased 0.1 ft. in width for each 100-ft. of distance in the direction of drainage. The contractor was required to finish the cut in perfect slope while surface ditches of adequate proportions were provided wherever conditions demanded. In the long cut, the first 2,500 ft. from the lower end is drained by side ditches carried to a catch basin 500 ft. from the lower end where a depression in the ground line made it possible to install a line of 24-in. pipe leading down a transverse gully. At a point 2,600 ft. from the lower end of the cut the ground surface comes practically to grade for a distance of 150 ft. where a double 6-ft. by 4-ft. box culvert



Steam Shovel in the Big Cut Near Zionsville

and the north section of second track work consists of light fills with only two slight changes of grade in the second-track portion.

The lowering of the grade south of Eagle Creek is being accomplished by making a preliminary cut along the east side to the final grade without disturbing the existing track. This could be done readily for a considerable portion of the distance without any excavation beyond the finished cut line because the cut had to be made of sufficient width to accommodate a passing track on the east side. After turning trains over a temporary track at grade in this portion of the cut, the old track will be abandoned and the rest of the cut taken out.

This cut and the long cut north of Eagle Creek are being taken out with 70-C Bucyrus shovels, the material being handled by standard-gage equipment into the Eagle Creek embankment and some minor fills by dumping from trestles. Two shovels are being operated in the north cut and one in the south cut, each being served by two trains of 12-yd. Western air dump cars. The complete equipment includes seven six-wheel switch engines and 100 cars. To keep the four trains

was installed to carry the drainage of a creek that crosses the line. By depressing the bed of this creek for a distance of 200-ft. downstream, it was possible to use it as the out-fall for water draining into the cut north of this point, as well as for a surface ditch extending for nearly the entire length of the cut along the east side and a channel diversion ditch one half mile long on the west side. These surface ditches were made with teams before the cut proper was started, the material being wasted on the site of the cut so that it could be picked up by the shovels in taking out the cut.

The structures formed an important feature of this project, chief among them being the Eagle Creek bridge which is located about centrally in the long embankment. This is a reinforced concrete arch structure of the filled-spandrel type consisting of five semicircular arches—three central openings of 45 ft. with one at each end of 39 ft. The total length of the bridge is 273 ft. with a maximum height of $62\frac{1}{2}$ ft. from base of rail to bottom of footing. It requires the placing of 6,200 cu. yd. of concrete and 112,000 lb. of reinforcing steel. Pile foundations were used.

Railway Developments in Foreign Countries

Authority Asked for the Construction of 1500 Miles of New Railroad in Mexico; Other Notes

American Railway Manufacturers May Be Under Handicap in China

(From our Special Correspondent in China)

While there is considerable feeling of disappointment that America has not been able to "put over" a reorganization of affairs in the Far East, Chinese are not disposed to blame either America or Mr. Wilson. But they do point out that unless something very pointed is done, American interests are completely in eclipse. The peace settlement clearly recognizes the "sphere of influence" in China. It intensifies the competition between British and Japanese, with the French-Belgian interests holding a position of balance of power. Under these conditions, since there is no American "sphere of influence" or room in which one can be set up, American manufacturers are relegated to a position of permanent handicap. For a year or two, until Europe gets back to a peace basis, there is likely to be a small market for materials which are urgently needed, in which Americans may bid with some hope of success. But after that, the "home" dealer, it is thought to be beyond question, will always have the preference.

* * *

The Peking Hankow has ordered 10 Prairie Type locomotives from the Baldwin shops and 10 more from the Lima works. Tientsin Pukow tenders are delayed pending a discovery of means of payment.

* * *

The Ministry of Communications has received advices concerning the arbitration of the Shanghai-Nanking Railway net profits case, to the effect that one of its contentions has been sustained, one decided adversely, and one reserved for further taking of evidence. Due principally to the favorable rates of exchange for interest payments, this line found itself with a surplus for the year in 1916. The ministry contended, however, that deficits from previous years should be met before profits could be divided with bondholders. This is the contention which is sustained. It also contended that interest upon land purchases, although in excess of the amount provided in the contract, should be deducted as expenses, before a declaration of profit. This has been denied. Its third contention was that its regular depreciation charges are a proper charge to expense before declaration of profit, and this point is still under consideration. The immediate result of this decision, so far as it goes, is to release \$1,250,000 held in the treasury pending the award. This line is sorely in need of locomotives. Because of overwork, its expense for locomotive repairs increased in 1918 over 50 per cent above 1917, and loaded wagons were constantly being left standing for want of power. Whether the necessities of the government for ready money will permit the use of this sum now in the treasury for the purchase of the needed power remains to be seen.

* * *

The Lung-Hai management has cancelled certain inquiries for bridge steel entered with an American firm just prior to the armistice. The explanation is that the line is now required to make such purchases "at home" (Belgium).

* * *

The nearest official admission of approaching bankruptcy which any organ of the government has made was contained in the recent report of a conference between a representative of the Ministry of Communications and rep-

resentatives of the stockholders of the late Chekiang and Kiangsu Provincial railways. The Chekiang and the Kiangsu Provincial railways represent two of the many attempts made about ten years ago to build Chinese railways with local capital. The officials and gentry of these two provinces undertook to build a line from Shanghai to Ningpo. This route was already under contract to the British and Chinese Corporation, but yielding to this local pressure the Manchu government secured a release from the British. Some six or seven years of painful progress, quarrels among stockholders, and exhaustion of funds brought a realization that a foreign loan and foreign management was necessary. The government, now the Republic, therefore took over the line, agreeing to refund the shares with its own bonds and cash. The two lines have now been consolidated, practically rebuilt, and are operated by the Shanghai Nanking administration. But the shareholders object to receiving their interest in depreciated bank notes, and demand certain cash payments which were promised in installments. The latter the ministry representative professed to be impossible at the present and soundly scolded the provincials for expecting anything besides depreciated bank notes "when the ministry had millions of them which it can not dispose of."

* * *

The Tientsin Pukow has now given notice of refusal to accept payment of freights or fares in anything but silver or its equivalent. This line has as managing director a brother of Hsu Shih Chang, president of the Republic. The other Chinese managed lines are still accepting the notes for payment of fares.

* * *

The situation is very tense over reports from the Peace Conference in Paris. It has been rendered more so perhaps by the very evident tampering with telegraphs and cables along the China coast. For two weeks Peking has been practically out of communication with the outside world, except over the Japanese wireless. At the same time reports in the Japanese papers seemed to be baiting Chinese into some act of violence. At the same time that assurances were extended that Japan had succeeded to everything it claimed in Shantung, a Japanese paper published in Chinese in Peking contained a circumstantial account of the assassination of President Wilson. The result was that on the following day students of government schools formed a procession and marched to the legation quarter with banners expressing disappointment and anger with Chinese officials, who are held responsible in the public mind for "selling China." The delegation was peaceable until upon arriving at the home of Tsao Ju-lin, Minister of Communications, it found gates barred and the minister refusing to appear. The procession was immediately transformed into a mob, which broke down the gates, rushed the guards, and made a search of the house, breaking everything in its way. The minister made his escape, but his father was badly beaten in the hope of provoking Tsao to appear from his supposed hiding place. Chang Chung-hsiang, minister to Japan, who signed with Tsao many of the treaties and agreements which are objected to, was found in the house in conference with a Japanese. The latter was quickly passed outside without violence, but Chang was beaten and kicked into insensibility, and is now in the Japanese hospital. Tsao and Lu Cheng Yu, who also has

been implicated in the recent railway deals, took refuge in the Japanese Legation.

Carranza's Railroad Program

Calls for 1,500 Miles of New Line

It is an ambitious program of government railroad building which President Venustiano Carranza has mapped out. In his recommendations to Congress authority is asked for the construction of more than 1,500 miles of new railway. It is expected that the recommendations will be favorably acted upon by Congress. It is significant that all of the proposed new lines cover practically the same routes that were designated in concessions that were held by American and British interests at the time their plans were upset by the beginning of the revolutionary period nearly nine years ago. The most important perhaps of the proposed new roads is that which is to run from a connection with the United Railways of Yucatan at Campeche, about 450 miles. The concession for the construction of this proposed line was owned by a syndicate of British investors at the time President Porfirio Diaz was forced to vacate the chair of chief executive. The route is through a remote part of Mexico that is said to be capable of wonderful agricultural development. The region is also rich in mahogany and other valuable timber. President Carranza's plan also embraces the construction of a railroad from Peto, state of Yucatan, to Chan Santa Cruz, in the territory of Quintana Roo, a distance of about 300 miles, including proposed branch lines. This proposed road would penetrate what was formerly the heart of the hostile Maya Indian country. The line would be of important military value, it is asserted. Another new line, the construction of which is recommended by President Carranza, has for its purpose the connecting of Ensenada, on the Pacific side of Lower California, with the Nogales-Guaymas branch of the Southern Pacific of Mexico, at a point a short distance north of Hermosillo. The building of branch lines is also contemplated. This proposed road would closely parallel the international border between Mexico and the United States and traverse a part of the rich Imperial Valley. It would also serve as a valuable factor in the movement of troops in time of troubles along that part of the border.

It is not questioned that the Mexican government may be able to assemble men and materials sufficient to carry out these railroad construction projects, but it is not understood where the equipment for operating the proposed lines is coming from. It is well known that the present railroad systems of the country are so short of equipment that traffic is far below normal. The new road which the government has constructed between Durango and a point on the old Mexican Central near Zacatecas is not being operated to any appreciable extent because of the lack of cars and engines. The same is true of the new line which the government recently finished between Cuatro Ciénegas and Sierra Mojado.

At this time a large force of men are employed on the construction of the railroad which the government is building between Durango and the Pacific port of Mazatlan. From an engineering standpoint this is one of the most difficult pieces of railroad ever attempted in Mexico. It involves the crossing of the Sierra Madres at an altitude of nearly 8,000 ft. and an almost precipitous descent to the sea-level of the coastal region. The late Collis P. Huntington, who built the old Mexican International from Eagle Pass, Texas, to Durango, had corps of engineers in the field constantly for several years endeavoring to find a feasible route over the mountains for the proposed extension to Mazatlan and none was found.

According to the report of engineers who have made an investigation of the physical condition of the National Tehuantepec, the expenditure of not less than \$15,000,000

gold will be required to place that line in shape to properly handle trans-isthmian traffic. This road was operated for many years by the British contracting firm, S. Weetman Pearson & Son, Ltd., of which the present Lord Cowdray is the head. The firm had the road leased for a period of 51 years from the National government, but on account of pressure that the Carranza administration brought against the lessees, the lease was given up and the line turned back to the government some months ago.

The Pan-American which runs from Piacho, on the National Tehuantepec line, to Suchiate, 284 miles, is also bad off physically. This line was constructed by David Thompson, former American ambassador to Mexico, and associates. They disposed of the property to the Mexican government during the latter days of the Diaz administration at a profit of many millions of dollars, according to report current at the time. The Pan-American was to have been a link in a through trunk railroad that was to have continued on down through the countries of Central and South America. Just across the river from Suíache is Ayutla, Guatemala. The original plan was to extend the railroad system of Guatemala to a connection with the Pan-American, but this has not as yet been done. The coastal region traversed by the Pan-American is capable of producing big yields of various kinds of crops. Large areas of land in the territory along both the National Tehuantepec and the Pan-American are owned by Americans but on account of disturbed conditions that have prevailed for several years most of these properties have long been abandoned.

The Mexican Southern Railroad occupies a unique position in the government affairs of Mexico. Although the line is owned by the government it has been in control of the revolutionists under General Felix Diaz for several years. Little is known here as to its physical condition. It is said to be giving very good passenger and freight service between points on its line in the state of Oaxaca.

The government recently ordered that construction of the branch line that is to run from Allende, situated on the Eagle Pass-Torreon division of the National Railways of Mexico, to Las Vacas, 75 miles, be resumed. From an international standpoint this is a very important piece of work for the reason that Las Vacas is situated just opposite Del Rio, Texas, and it is purposed to connect there with the branch line of the Kansas City, Mexico & Orient that is to be constructed south from San Angelo. The National Railways of Mexico and the Kansas City, Mexico & Orient entered into a contract several years ago to jointly build a bridge across the Rio Grande at Las Vacas-Del Rio. The accomplishment of this project will mean the opening of a new international railroad gateway between the two countries.

American Rivalry in Steel

Discussed in British Parliament

In the British Parliament on May 26 Lieutenant Colonel Sir F. Hall asked Sir Auckland Geddes, minister of national service and reconstruction, whether America was now able to import steel into Great Britain at a price which enabled manufacturers in the United States to undersell British manufactured steel by £4 10s a ton and upwards, after allowing for freight and all other costs; and, if so, what practical steps had been taken by the government to meet the position thus arising. In reply Mr. Geddes said: "I understand that American steel manufacturers are quoting prices for delivery in the United Kingdom lower than those quoted by British manufacturers (though, not so far as I am aware, to the extent suggested). As regards the second part of the question, his Majesty's government is) not prepared at present to impose any restrictions upon the importation of iron and steel, in view of the demand in the country."

Sir F. Hall interposed: "Is the right honorable gentleman aware that the difference of price is upward of £9 10s and that the government has undertaken to protect the interests of this country? Are they going to do anything or are they not?"

"Under the provisional trade policy that is being followed," Sir A. Geddes replied, "the interests of this country are being protected to the best ability of the government, and the matter is not so simple as the honorable gentleman appears to imagine. There is a very great demand for iron and steel in this country, which at present the producers of this country are unable to meet."

"Is not iron being produced at places which are much nearer the United States, and does it seem reasonable that Americans should be able to send this produce to this country at £9 13½s per ton lower to the detriment of the manufacturers in this country?" asked Sir F. Hall.

"I do not know whether it is reasonable or not, but it is a fact that they are producing iron and steel at the present moment cheaper," was the answer, "and it is also a fact that our export still demands a large amount of iron and steel to be worked up in things to be exported."

President-Elect of Brazil to Visit United States

Dr. Epitacio Pessoa, who was elected president of Brazil on April 13 while he was in Paris serving as president of the Brazilian delegation to the Peace Conference, is to visit the United States on his way back to his country and is expected in New York on June 20. Dr. Pessoa is one of the first presidents of Brazil to be elected from a northern state, the presidents as a rule having hitherto been of the more populous and further developed southern regions. He is a comparatively young man. After taking his degree with honors in one of the leading law schools of Brazil, he became public prosecutor in the state of Pernambuco, where he revealed striking legal and oratorical abilities. He came rapidly to the front with the proclamation of the republic in 1889 and his reputation as a jurist won for him the position of professor of law in the faculty of the University of Pernambuco. At only 26 years of age, he was elected deputy to Congress and became one of its leading figures.

Before he was 33 years of age, President Campos Salles invited him to be minister of justice and public instruction in his cabinet, where he rendered brilliant service. Later, he occupied the position of attorney general for the republic and became a judge of the highest judicial body of Brazil, where, in the execution of his duties, he was noted for his firmness and impartiality. At the time he was appointed president of the Brazilian Mission to the Peace Conference, he was serving as senator from the state of Parahyba.

Train Connection with Southeastern Europe

Mr. Chaveille, the French minister of public works, presided recently over a meeting of diplomatic and technical representatives of Great Britain, Belgium, Switzerland, Italy, Serbia, Roumania, and Greece, called to consider under what conditions a train service could be established with the southeast of Europe to replace the former Orient express, writes Trade Commissioner Eliot G. Mears at Athens.

The proposed line will pass through the Simplon Tunnel, Milan, Venice, Trieste, Agram, and Belgrade. Ultimately the line will be prolonged to Bucharest and Constantinople, where a connection will be established with the Bagdad railway. A branch will go to Odessa. The project of building a suspension bridge to connect the two shores of the Bosphorus was also considered. This bridge would serve as a line of communication with Asia.

Train service with the Balkans will probably be established very soon, although no definite date has been set.

According to a plan announced in London, two trains will meet at Milan, one from Calais and one from Bordeaux. From there a single train will proceed to Brod, where a second division will be made with one part of the train going direct to Constantinople through Bucharest, while the other part will run direct to Odessa.

Exports of Railway Track Material in April

Exports of rails amounting to 60,463 tons valued at \$3,416,590 showed an increase over March but did not reach as high totals as in January or February. Exports during April of railroad spikes amounting to \$413,292 and of switches, frogs, etc., amounting to \$1,063,437 were, on the other hand, considerably greater than for any of the preceding months of the year. The figures in detail as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce were as follows:

Countries	Railroad spikes		Rails of steel		Switches, frogs, splice bars, etc.
	Pounds	Dollars	Tons	Dollars	Dollars
Belgium			3,802	197,098	21,116
Denmark			200	13,163	1,007
France	4,746,100	267,761	15,153	859,483	645,152
Italy					33,750
Norway	3,254	183	40	2,598	203
Portugal					725
Spain			646	32,755	19,734
Sweden	405	54			
England			1,581	90,530	5,404
British Honduras	1,000	52			28
Canada	118,387	3,908	10,717	429,015	61,700
Costa Rica	100	10			375
Guatemala	10,000	500			1,797
Honduras	16,760	805	121	8,275	
Salvador	16,200	892	2	188	34
Mexico	200,537	8,525	152	8,559	2,683
Newfoundland and Labrador	22,400	1,142			
Barbados					402
Jamaica	20,000	1,000			1,308
Trinidad and Tobago			179	12,555	1,008
Other British West Indies					486
Cuba	147,711	7,261	7,133	382,287	97,139
Dutch West Indies	5,852	448			
French West Indies	600	32	2	204	2,606
Haiti	28,000	1,170			11,350
Dominican Republic	2,000	123			765
Argentina	12,184	785			338
Brazil	270,000	14,820	631	47,700	6,359
Chile	172,656	10,173	5,404	337,441	48,082
Colombia	21,110	994	158	11,174	7,806
Ecuador	2,000	92			220
British Guiana	44,600	2,277	209	10,290	7,414
Peru	29,030	1,619	192	15,040	7,456
Uruguay					225
Venezuela	20,000	965			637
China	285,000	11,458	901	59,664	
Japanese China			2,581	193,964	17,550
British India			516	36,231	4,554
Dutch East Indies	326,448	31,574	1,219	59,779	31,374
Hongkong	1,028	49	44	2,989	269
Japan	522,188	19,429	6,375	462,708	10,104
Russia in Asia	732,800	23,687	1,225	59,441	7,625
New Zealand	4,480	260	139	8,925	487
Philippine Islands			777	54,822	3,157
British West Africa	16,800	1,244			
British South Africa			100	6,417	
Egypt			264	13,295	1,008
Total	7,799,630	413,292	60,463	3,416,590	1,063,437

Exports of Locomotives in April

The exports of locomotives from the United States in April, totaling 55 and having a value of \$2,193,168 were more than double those of March but not as great as in January or February.

The detailed figures as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Steam locomotives	
	Number	Dollars
France	8	379,600
Italy	10	575,000
Canada	5	49,100
Cuba	12	364,889
Brazil	1	10,950
Colombia	3	85,085
China	5	260,000
Japanese China	8	457,986
Japan	3	10,564
Total	55	2,193,168

Tokyo Considering Building a Subway

The city of Tokyo, Japan, is considering the building of a subway to help relieve its serious transportation problem. But in the meantime, and in order to receive immediate relief, the mayor of the city has recommended to the city council the purchase of 200 additional street cars.

Railroad Affairs in Congress

CONGRESSIONAL CONSIDERATION of the general railroad problem has been somewhat delayed by the precedence given by the Senate and House committees to other matters in an effort to clear the decks, but Chairman Esch of the House committee now hopes to begin hearings either next week or the following week, depending on the time required by the water power bill, which will probably continue for about two months, and at which the director general and the Interstate Commerce Commission will probably be given the first opportunity to testify. The passage of the deficiency appropriation bill for the Railroad Administration has not been responsible for any delay because it was handled by the appropriations committees and not by the interstate commerce committees, but both the House and Senate committees have given some time to the problem of getting the wire systems returned, while the House committee has been concerned with the farmers' demands for the repeal of the daylight saving law and the Senate committee desired to do a little tinkering with the railroad laws before tackling the big question. Senator Cummins, who is in charge of general railroad matters, was ambitious to get through his bill to restore the Interstate Commerce Commission's power to suspend rates and other Senators took advantage of the opportunity to dispose of another question that has been disturbing them by tacking on an amendment requiring the director general to pay out of the railroad rental judgments based on claims that accrued before federal control. Many of such claims had been held up because it was not considered the duty of the government to pay them and many railroads were unable to pay them or took advantage of the fact that their property could not be attached while under federal control.

Some of the Senate committee members are also sympathetic toward the bills to amend the fourth section to require a strict enforcement of the long and short haul rule and hearings were held before the committee last week on Senator Poindexter's bill. Some of the Senators who had got their views on the question principally from the representatives of the inter-mountain country who have been most in evidence during the previous discussions on this subject, had their eyes opened when the first testimony was presented at this hearing by prominent representatives of a large number of shippers who vigorously opposed the bill and showed that its passage would not only not accomplish the desired object but would disrupt the rate structure in practically all parts of the country.

The Cummins bill, if it becomes a law, would leave the director general no more power to put rates into effect than that formerly possessed by the railroads. He may continue to initiate rates, but must file a fifteenth section application with the commission for permission to file a tariff increasing a rate, until January 1, 1920, when this provision of the law expires, and the commission may suspend his rates if it sees fit. Heretofore the Railroad Administration, while it has frequently consulted the commission, has merely filed its rates and set the effective rate, regardless of the former statutory 30 days' notice in many cases. The commission could review them later on complaint, and it has made several minor changes without any attempt to disturb the general 25 per cent advance, but meanwhile the rates were in effect. As to intrastate rates, the director general is still supreme, on the

theory, as stated by Senator Cummins, that it would be intolerable to have the federal administrator subject to the interference of 40 states. Efforts were made by several Senators to restore the former authority of the states, but it was recognized in the debate that the purpose was to give them an opportunity to reduce the rates increased by the Railroad Administration and that even if they did not do so affirmatively the state statutory rates might be put into effect. Senators Sheppard of Texas and McKellar of Tennessee introduced amendments to restore the state authority but were voted down after Senator Cummins had stated that it might be possible for the states, if given the authority, to reduce the federal income by \$200,000,000. Senator Trammell of Florida, however, secured the adoption of an amendment providing that no intrastate rate shall be increased until at least 30 days' notice has been given to the shippers of the state and a hearing granted. Another amendment provides that in computing the time allowed for presenting claims or bringing suit for reparation or loss or damage, the period of federal control prior to the passage of this bill shall be excluded.

The principal provision of the bill is as follows:

That during the period of federal control the right to initiate or change rates, fares, charges, classifications, regulations and practices exercised by the carriers now under federal control, prior to the 29th day of December, 1917, shall hereafter be exercised by the President, or by the director general of railroads, but such right as to interstate commerce shall be exercised under all the limitations and conditions which were imposed upon said right by the act to regulate commerce, approved February 4, 1887, as amended; and the Interstate Commerce Commission shall have as full and complete authority and jurisdiction to set aside, change, modify, suspend or otherwise review all such rates, fares, charges, classifications and regulations directly affecting interstate commerce as though the government had not assumed the possession and control of said transportation systems. To that end the said act to regulate commerce, as amended, is hereby declared to be in full force and effect with respect to rates, fares, charges, classifications, practices and regulations, anything in the act approved March 21, 1918, to the contrary notwithstanding. The procedure before the Interstate Commerce Commission shall be the same as formerly, except that the President or the director general of railroads shall stand in the stead of the carriers, and all notices theretofore required to be given to or served upon carriers shall be given to or served on said director general. All orders or findings of the commission shall bind the director general to the same extent as they formerly bound the carriers.

While this would make it slightly more difficult to put into effect a general advance in rates there is a belief that it offers a sharing of responsibility between the director general and the Interstate Commerce Commission that might not be unwelcome to both parties.

Senator Pomerene especially took occasion during the debate to criticize many of the rate and other orders issued by the director general. He said in effect that as a railroad man Mr. McAdoo was a wonderful secretary of the treasury. He also pointed out that whereas Mr. McAdoo had claimed a saving of \$6,000,000 last year on the salaries of executives, an examination of the director general's payroll indicated that there had not been much saving in the long run. He said that 72 men on the staff of the director general receive salaries aggregating \$1,398,100, or an average of \$19,418, which he compared with the \$15,000 received by the chief justice of the United States.

Several Senators said they were more interested in getting the railroads back to their owners than in the bill before them and expressed an opinion that the question of rate jurisdiction could well wait to be considered in connection with the proposed general legislation, but they were willing to support the bill. In reply to a question as to when such legislation could be expected, Senator Cummins expressed confidence that it could be worked out before the end of the year.

H. C. Barlow, representing the Chicago Association of Commerce, the National Industrial Traffic League, the Illinois Manufacturers' Association and the Illinois Traffic League, in testifying on the Poindexter bill said that those for whom he appeared are opposed to a rigid application of the long and short haul rule and that the act as it now reads is conducive to the greatest good to the greatest number. The commission should continue to have the broadest discretionary power because each case presents a different aspect. He said that if the railroads were prohibited from meeting the

water rates the intermediate points would not get the benefit anyway and he pointed out that the rates on sugar from San Francisco to Chicago are less than those to Kansas City because the western sugar industry could not reach the Chicago market in competition with Cuba by New York and New Orleans if the rates were higher. In such a case, he said, Chicago would be dependent on one source of sugar supply.

J. C. Lincoln, representing the Merchants' Association of New York and the National League of Commission Merchants, said the question involved is that of the railroads competing with water carriers and that the possibility of an all-water service from New York to the Pacific coast causes keen competition which the railroads have to meet if they wish to participate in the traffic. If not allowed to participate their ability to conduct their other business would be impaired and he thought the eastern shippers were entitled to the benefit of both rail and water facilities.

W. H. Chandler, who appeared for the Boston Chamber of Commerce and several New England industrial organizations, pointed out that a rigid long and short haul rule would encourage an increase in the water rates and would require the rail carriers to increase their non-competitive rates to make up for the loss of the other business. He also said that enforcement of a rigid long and short haul rule would mean either a very material advance in rates in the southeastern territory or a reduction of all rates to the level of the Mem-

phis and Mobile rates and that such a change would put New England out of market.

Senators Poindexter, Cummins and Pomerene kept referring to the argument that the present adjustment penalizes the intermediate points for the benefit of those enjoying water competition, while the witnesses asserted that their only penalty was by comparison with localities better situated.

J. A. Morgan, representing Texas shippers, and E. J. Rich, representing New England shippers, also opposed the bill.

E. E. Clark of the Interstate Commerce Commission testified on June 17, opposing the bill. He said he could not see how any public good could result from it while it would uproot rate structures representing years of development. He said the commission had done its best in applying the law but had felt it necessary to prevent undue disturbance of business relationships and had narrowed its policy in regard to meeting water competition from one of recognizing potential competition to recognizing only actual and active water competition as a justification for fourth section relief. He thought the commission should have power to establish minimum rates and to have control over the rates of water carriers and that possibly it would be well to lay down some rule to govern the commission in its application of the fourth section.

The representatives of the intermountain section were to be given their innings on Thursday.

New York Commission on the Collision Problem

Mechanical Automatic Stop Discussed and the Inventors Give Full Descriptions of Their Devices

THE NEW YORK Public Service Commission, Second District, held a hearing on the collision problem in New York City on Wednesday, June 18. The hearing was conducted by the full commission, Charles B. Hill (chairman), Frank Irvine, John A. Barhite, Thomas F. Fennell and J. A. Kellogg; with C. R. Vanneman, chief of the Division of Steam Railroads. Among those attending the hearing, many of them invited by the Commission, were F. P. Patenall, signal engineer of the Baltimore & Ohio; Frank Rhea, engineer, New York City; W. Y. Scott, signal engineer of the Boston & Maine; J. D. Bourne, superintendent, Boston & Maine; J. E. Sague, former member of the Public Service Commission; Frank J. Sprague, of the Sprague Safety Control and Signal Corporation, New York; D. H. Schwyer of the Schwyer Electric & Mfg. Co., Easton, Pa.; J. F. Webb, Jr., International Signal Company, New York; C. E. Doyle, "M-V All Weather" train control system; C. G. Riddick, locomotive engineer; Thomas E. Ryan, representing locomotive firemen; and other engineers.

Messrs. Sprague, Schwyer and Webb spoke in advocacy of their respective systems and the locomotive men outlined the necessary elements of safety as viewed from their standpoint; while Messrs. Sague and Rhea appeared as independents, not favoring any railroad, any device or inventor or anything but the public interest.

The first speaker was Mr. Patenall. He suggested a closer alliance between the railroads and the inventors and said this was being done at present through the Automatic Train Control Committee of the Railroad Administration. He briefly outlined some of the systems of train control that have been tested. It has taken approximately 30 years to develop the present system of automatic visual block signals and it will be necessary to have patience in the development of train control apparatus.

Mr. Scott told of the practice with automatic block signals

on the Boston & Maine where each signal goes to the stop position before it is reached by the train which sets it; that is to say, the signal is set 200 ft. beyond the entrance to the block section; and the engineman, seeing it move, knows that it is in working order and will indicate stop behind his train.

Mr. Bourne told of his experience with surprise tests. He said that the Boston & Maine conducted large numbers of these tests which, he felt, were instrumental in securing proper observance of signal indications; personally he felt that an automatic train control would be a desirable adjunct.

Mr. Sague believed that safety of operation could be improved by using a full block overlap which would make it necessary for an engineman to run by two stop signals before colliding with a train ahead. At the time the full block overlap was discussed by the commission, some years ago, the members were divided on this question, as some felt it would have a tendency to make the engineman less vigilant in the observance of signals. He suggested the physical examination of enginemen who had reached a certain age; the further development of the present signal systems, and the use of surprise tests to improve discipline. It was a question in his mind whether generally speaking, a man of 60 odd years should be allowed to run high speed trains. Mr. Patenall raised an objection to the use of a full block overlap; it does not tell the engineman the truth as to actual conditions ahead. Mr. Sague favored automatic speed recorders on locomotives. He spoke of the high record for safety made by English railroads, where the flagman and the perplexities of the flagging rule, as experienced in this country, are unknown, and suggested that American roads ought to heed this lesson from British practice.

Mr. Webb described his mechanical automatic stop as it was tested over a period of two years on the New York, New Haven & Hartford. This apparatus was described in the *Railway Age Gazette* of April 13, 1917, page

789, and copies of this description were handed to the commissioners. Referring to electrical devices, with no mechanical contact, Mr. Webb said that there should be no unseemly rivalry; there would be room for several companies in this field; no one manufacturer can supply all the requirements of all the railroads. He claimed the advantage, for the mechanical device, that no further demonstration was needed. His two years' test had demonstrated the integrity of his apparatus. It had functioned properly in all weathers, through two winters, with never a failure; not even failures on the safe side (which cause unnecessary stops). His is the only machine that has been tested which operates at every signaling point, both when the road is clear and when it is not. The air valve is opened directly by the vertical member, when it comes in contact with the ramp on the roadway, requiring no intermediate apparatus. In addition to the apparatus that was tested, Mr. Webb has also a mechanical speed control device depending upon centrifugal force and the force of gravity.

He estimated the cost of equipping one engine and one signaling point at \$500 and was sure that he could provide satisfactory apparatus at a lower price than Mr. Schweyer, while Mr. Schweyer had named figures lower than those quoted by Mr. Sprague. The apparatus can be maintained by an ordinary mechanic; no special talent required; and repairs and renewals are not costly.

Asked about the results of his tests as throwing light on the effect of an automatic stop on the mind of the engineer, Mr. Webb believed that it was good rather than bad; the experience with automatic stops on the Interborough lines in New York City and on the Chicago & Eastern Illinois has shown that the enginemen are more vigilant, not less so. His company has already invested money amounting into six figures, but the conservative attitude of the railroads and the delays incident to the war have halted progress.

Mr. Schweyer described his induction apparatus which is now being tried on the Colebrookdale branch of the Philadelphia & Reading extending from Pottstown, Pa., to Barco. This apparatus was tried last year and was described in the *Railway Age* and, with illustrations, in the *Railway Signal Engineer*, but a new and more extensive installation is now being made for the inspection of the Committee of the United States Railroad Administration.

The induction apparatus is the only practicable automatic stop, because of the difficulty with clearances if mechanical devices are used. Induction is the only means of meeting climatic conditions. The air mechanism, as well as the electric circuits, must be normally closed so that a leak in the main reservoir will cause an application of the brakes. Audible indications may or may not be given in the cab. Audible signals at the roadside are not practicable in the present state of the art, as they must be designed on the open circuit principle. The air brake mechanism must be such that by merely turning a valve the application may be made either service, or emergency, and the service application must be of a predetermined amount, to be decided by the railroad company.

The public should demand that a start be made, even if money has to be spent lavishly in making tests. Millions of dollars have been spent on experiments in this field by private parties, and if a definite policy is not soon decided upon there will be little encouragement for further activities by inventors.

After the government committee has made its inspection (about July 7), Mr. Schweyer invites everybody else to come to Pottstown and see his apparatus. This can be observed in the baggage car; visitors need not ride on the engine. Mr. Sprague told of the experiments which he has been making during the past five years, and outlined what he held to be the wise policy to be pursued by the state and the rail-

roads. His device, which has met successfully the criticisms of the most conservative signal engineers, is still in the laboratory stage, but the United States Railroad Administration has asked him to prepare for an installation as soon as he is ready to do so.

Thomas E. Ryan, speaking in behalf of the Brotherhood of Firemen and Enginemen of New York State, called for the abolition of surprise tests, which he declared to be grossly unfair. He said that he expected the Director General of Railroads to issue an order forbidding such tests. Mr. Ryan answered numerous questions put to him by the commissioners. He and other spokesmen for the locomotive men protested against relaxation or suspension of the flagging rule (which had been suggested by another speaker). The firemen and enginemen want the flagging made more thorough and complete, both within and without yard limits.

Mr. Rhea gave in condensed form his views of the whole collision problem. He said, in substance: "There is a decided public sentiment in favor of requiring installation of devices for prevention of rear and butting collisions. This opinion is held by many representative business men, who doubtless have but vague ideas of the probable large cost of installation, the heavy continuing expense for maintenance and operation and the probable restriction of traffic capacity of the railroad; but the time has arrived for determining the real possibilities and limitations of automatic train control. The development of automatic train control can be properly done only by completely equipping given railroads of considerable length and operating automatic train control under actual service conditions. On account of the probable great cost the expense can best be borne and probably can only be provided as a matter of public expense instead of being borne directly by the railroads equipped. There must be entire unity of action by all interested parties, particularly by the regulating Public Service authorities.

"Methods of train direction can be divided into two generic classes: (1) Manual direction, including ordinary telegraph despatching, central controlled staff operation for single lines and lock and block for multiple track lines; (2) automatic direction, in which I include the so-called audible and cab signal systems as well as the usual automatic visual fixed signals.

"All classes of train direction and automatic train control must be considered as between single track lines with traffic in both directions and multiple track lines with traffic in one direction only on assigned tracks. To permit of the most desirable arrangement of single track automatic train control it is highly desirable, if not actually necessary, for the train control to be both 'cautionary' and 'stop.' For multiple track lines with traffic in one direction only on assigned tracks, while 'cautionary' control might be desirable, this is not a necessity particularly, as full protection can be provided by a complete overlap, although this arrangement may substantially restrict the traffic capacity of the line.

"There are at least two and probably three or four typical arrangements of automatic train control which can be installed as workable systems. The best ultimate system of automatic train control would be obtained by appropriating the best features of several suggested arrangements and combining these. The more simple problem of multiple track installation should first be attempted, to get the benefit of this experience for the more difficult problem of single track train control. It is highly desirable that all parts of all systems be standardized as far as practicable. If the best results are to be obtained, it is absolutely necessary that there be entire unity of requisites for the same classes of roads by all public regulating authorities. It is highly desirable that there shall be only one set of standards and requisites for the entire United States.

"To attain the best results the situation warrants tem-

porarily commandeering the best qualified men in the United States to carry out test installations; the number of thoroughly qualified men at present is limited. If overlapping of patents prevents the adoption of the best system the good of the public service warrants the commandeering of such patents as may be necessary for carrying out the best composite installations. Some railways are better adapted for trials than others and the situation warrants the commandeering of such railways, if necessary.

"With approval rather than criticism of past policy I feel warranted in making the statement that the installation of improved systems of train direction in the past has been equally a matter of expediting the movement of traffic as well as the safeguarding of the traffic. In fact the installations in many instances has been made on the basis of expediting the move-

ment of traffic as one of the best means of safeguarding it. In all probability installations of automatic train control will somewhat restrict the traffic capacity of the railroads so equipped.

"The cost of installation and expense of maintenance and operation no doubt will be very considerable, especially when taken into consideration with the possible restriction of traffic capacity, but in my opinion no definite conclusion can be arrived at until actual working results of automatic train control are available. Therefore, I believe unity of action by all Public Service regulating authorities is necessary and that the cost of installation and the extra expense of maintenance, operation and indirect expense, if any, of restriction of traffic, is properly a charge which should be borne by government appropriation."

Canadian Railway Progress During 1917-1918

Forty-Four Per Cent. of the Mileage of the Dominion Is Now
in the Hands of the Government

By J. L. Payne

Comptroller of Statistics, Department of Railways and Canals, Ottawa, Canada

THE RAILWAYS OF CANADA had gross earnings of \$332,777,937 for the fiscal year ended June 30, 1918, which was in the nature of a high level record. This total was \$19,284,988 better than that of the preceding year, and, to make such an encouraging feature more striking, it was \$89,694,398 above the showing for 1914—the year prior to the outbreak of war. The latter increment alone was greater than the aggregate of gross earnings no farther back than 1902. In fact, everything on the side of receipts was most satisfactory. Per mile of line, they reached \$8,493, which represented a gain of \$442 over 1917. Freight traffic swelled in volume and yielded a higher average per ton and per ton per mile. While the number of passengers carried showed a slight decrease, passenger train revenue and the average receipts per passenger per mile were above the results for the year before. All the conditions on the inflow side suggested growth and prosperity.

It would be very agreeable to stop there and ignore the other side of the account. The facts growing out of the positive side of railway finances in 1918 would make a gratifying and inspiring story, and it is always pleasant to be the bearer of good tidings; but the truth must be told. Despite the buoyancy of business and the expansion of revenues, the railways of the Dominion had rather a hard year. Operating expenses not only ate up the extra income, but made serious inroads on normal net earnings. Since all the operations of railroading find a focus in the running of trains, the results for 1918 may be summarized quite conveniently and illuminatingly in this vital statement. That whereas earnings per train mile increased for the year by 12.1 per cent, operating expenses per train mile increased by 29.5 per cent. In other words, while receipts grew by \$19,284,988, operating expenses grew by \$51,233,446. The railways were practically poorer by that difference. Net operating revenue fell from \$87,880,842 in 1917 to \$56,264,714 in 1918. Thus, while receipts gave encouragement, outgo brought despair.

The situation in Canada in 1918 will be better understood on further analysis. Out of 68 reporting units, 30 did not make one hand wash the other as between gross earnings and operating cost. Three more fell below superficial solvency when taxes had been paid. After deducting further fixed charges there were only 24 survivors, and of these six were

able to declare dividends. The aggregate of dividends was \$37,403,499, and of that the Canadian Pacific paid \$36,278,672. These facts put the whole case in a nutshell.

The railways, of course, saw the finish coming. It would perhaps be more in accordance with actual experience to say they felt it coming. They applied for relief in the only way relief was practicable—by being allowed to charge higher tolls. Resistance at once came from all quarters. Some of it was broad and general, in the sense that it was contended all passenger and freight rates were as high as they should be allowed to go; but the chief pressure was against the prosperous Canadian Pacific being permitted to better its earning power. The Railway Commission answered to the logic of stern and indubitable facts by granting increases equal to about 40 per cent all round, but, sheared the Canadian Pacific of any direct share therein by providing that all net earnings of that road created by the new rates should go into the Dominion treasury. The higher tolls went into effect in August, 1918, and will be reflected in the operating results for 1919.

In what particulars did operating expenses increase in 1918? On the surface, it would appear that all accounts were affected; but on further examination it is made clear that the chief difference between 1918 and 1917 was in the cost of labor and materials. The railways actually employed about 3,000 fewer persons, and yet the salaries and wages bill for the year was higher by \$22,648,766. Cost of materials made up in large measure the balance of the increase in operating expenses. If the figures attaching to the eight divisions of accounts be put side by side they practically tell their own story:

	1917	1918
Way and structures.....	\$41,154,193.11	\$51,614,857.71
Equipment	46,371,178.39	57,304,234.84
Traffic	6,236,810.91	6,342,393.99
Transportation—rail line.....	114,327,343.71	145,107,396.15
Transportation—water line.....	3,271,892.62	1,552,958.83
Miscellaneous operations	3,962,543.94	4,443,665.75
General expenses	7,584,881.55	7,597,985.10
Transportation for investment—Cr.....	18,207.15	8,056.58
Total	\$222,890,637.08	\$273,955,435.79

I have not taken up the space to show the percentage of each division in its relationship to the total; but the figures in that regard are surprisingly alike for the two years. That

is to say, the cost of maintenance of way and structures in 1917, for example, was 18.46 per cent of total operating expenses, and in 1918 it was 18.84. Maintenance of equipment showed 20.80 as against 20.92. To keep up those percentages, owing to the higher cost of labor and materials, meant a larger outlay in 1918, as compared with 1917, by \$21,393,721. This condition ran down through the whole list, and it very clearly and emphatically shows that the railways had to meet the higher cost of living created by the war in precisely the same degree as had individuals. If food, clothing and so on, cost railway employees more money, that additional cost had to be provided by the employers; and it was reflected quite directly in operating expenses.

It may be worth while to pause right here and interject a thought or two about this cost of living, which we see very clearly concerns the railways in a vital way. During the American civil war, and until 1866, the prices of all commodities went steadily upward to a very high level—in some respects almost as high as at present. Then they receded. The whole duration of rise and fall was not above twelve years. In fact, by 1870 the recession was very marked. The upward flight began with abnormal conditions, among which the low ratio of specie to total currency was an outstanding fact. The rise of prices from which we are now suffering began in 1896, and ran concurrently with a remarkable period of trade expansion and prosperity world-wide in scope. It was first demonstrated in the higher cost of food, and this led, quite naturally, to demands for better wages. In 1865 there was scarcely a trace of organization on the part of labor; in 1896 there was a vast change in that regard. The fattening of the pay envelope increased the power to bear the rising burden of food cost, which, we must see, was not attacking the problem at its base, but at its apex. Had a courageous and determined effort then been made to check the upward movement of food prices we should probably have a different situation today; for we must definitely recognize the basic character of food prices in relation to all prices. Higher wages to meet the higher cost of living was a process so much to the taste of the food profiteers, whose vast and powerful organizations had full control of supply, that from that time onward they persistently took advantage of it.

Higher wages quite logically and unavoidably meant the higher cost of all products into which labor entered. Thus was begun, with steadily increasing momentum, that process of reciprocal leverage by which the cost of one thing raised the cost of another. It has brought us to our present distressing position. The conditions being fundamentally different, there is scarcely any ground for the hope that the experience of 1862-1870 will be repeated. In my humble judgment, after most painstaking study of the whole problem, not only will prices be maintained, but they may be further advanced. The law of supply and demand cannot possibly be identified as the controlling factor in what has occurred, particularly during the past three years. What we have seen has been the easy triumph of organization over unorganization—the strong in that respect winning against the weak. On one hand, tremendous forces have been behind the exploitation of the world's needs for food, without regard to the adequacy of supply; on the other, consumers have not made the slightest attempt at co-operation and therefore have not offered resistance. In short, no matter from what angle our bitter experiences may be viewed, the whole trouble may be quite clearly traced to this lack of resistance. Hence, if a remedy for high prices is to be found it must have its foundation in some effective form of opposition. Market prices are made by human beings and not by the force of automatic and inexorable laws.

Can this resistance be asserted? To reply in the negative is to admit the loss of the war by the Allies. If the struggle was in behalf of democracy, and victory has come to those

who fought for that lofty principle, then the judgment of the majority must prevail. The winners are sane and sagacious. They can do anything for the common good if they are agreed about it and in earnest. Since food prices are clearly recognizable as forming the basis of all prices, then the course of action suggested is to proceed in a firm and comprehensive way to stabilize them. This should be done on the just ground of cost plus a fair profit. The cost of producing a pound of butter or a dozen of eggs can be ascertained with greater accuracy than can the cost of moving freight by a railway. We have seen freight rates fixed by law for a generation past, without any reference to the alleged law of supply and demand, and the producer of transportation is not in any essentially different position from the producer of food. What has been deemed just for one surely cannot be unjust for the other. If this is not done, then we must be prepared to see the operating expenses of railways rise with the upward movement of everything else.

The whole process by which the cost of food is first crystallized into the cost of labor, and then by reaction into the cost of everything which labor needs—moving upward at one end and then at the other in response to changing gravity—can only be arrested by taking control of the fundamental factor. That factor is food. It is now yielding what many regard as a high and more or less unearned profit to producers; yet prices will unquestionably continue to ascend unless steps are taken to interpose the thing now lacking—resistance.

From this digression, if it can be so regarded at a time like this when the responsiveness of railways to general conditions should be clearly recognized, we must get back to the presentation of further statistical facts regarding the year 1918. It has been said that traffic was buoyant. It was actually the best in the history of Canadian railway operations. Tons of freight rose from 121,916,272 to 127,543,687. For this higher volume of business the average receipts per ton per mile amounted to .736 cent, as compared with .690 in 1917 and of \$1.789 per ton, as against \$1.765 for the year preceding. The average trainload was raised from 436 to 457 tons, and in this betterment lies one of the brightest features in the story of 1918. It was by such means the strain of financial conditions was in some degree met. Tonnage per mile of road expanded from 3,159 to 3,281.

It must be borne in mind that Canada still has a considerable mileage of undeveloped line. The total operating mileage in 1918 was 38,879, which was 247 miles ahead of 1917. Since the outbreak of war in 1914 the addition to mileage has been 8,084. This would seem to indicate considerable activity in construction; but, as a matter of fact, it merely represents the completion of mileage which was under way when Germany invaded Belgium. Not a single new project has been undertaken since 1914, and at this juncture it does not seem probable that much railway building will be done in the near future. There are two difficulties in the way—high cost, and the uncertainty of subsidy aid by government. Practically all railways in Canada, with the exception of some of those which are owned in the United States, have been given substantial subventions. This policy of stimulating the increase of transportation facilities, in which the people heartily concurred, is alleged to have carried the Dominion beyond its immediate capacity to assimilate; but, apart from that consideration, the burden of debt arising out of Canada's conspicuous part in the war may call for rigid economy during the next decade at least.

Leaving aside all further references to merely statistical data, this brief sketch in relation to the year 1918 would not be complete without some allusion to the altered conditions under which 1919 was begun. On July 1, 1918, government assumed full possession of the Canadian Northern

System, thereby adding 9,479 miles to the 4,334 operated by the state at that time. Since then the Grand Trunk Pacific, with 1,794 miles of line, has passed into the hands of a receiver, and the Minister of Railways holds the assignment. To this might be added 1,000 miles owned by the Grand Trunk Pacific Branch Lines Company; so that, actually and prospectively, it might be assumed that government ownership has been applied to a system aggregating nearly 17,000 miles, or approximately 44 per cent of the total mileage of the Dominion.

This will appear on the surface like a very sweeping and significant change, and so it is; but due regard must be had to the facts of the case if a misunderstanding is to be avoided. This has come about wholly because of financial conditions. The Canadian Northern had fallen into difficulties just before the war, and with the outbreak of hostilities was unable to carry on its financing. Government was the guarantor of about 75 per cent of its total obligations, and because of that important fact deemed it expedient to take over the road. Although a decision has not been reached with regard to the Grand Trunk Pacific, the situation as respects guarantees is practically the same. The acting Prime Minister, speaking recently in Parliament on the railway situation, implied that it might also be necessary to absorb the Grand Trunk. In that event more than half of all the mileage in Canada would be brought under government ownership. Up to a few years ago the Dominion merely operated the two lines of railway, representing about 1,800 miles, which had been built as an integral part of the bargain of confederation.

It is no part of my purpose to write a single syllable either for or against the principle of government ownership. It is solely my intention to present in the briefest possible form, without comment, the facts of the case for the information of American readers. Let it therefore be clearly understood that the present situation in Canada was brought about by circumstances of a purely monetary character. Government might be regarded as having no choice in the matter. Be that as it may, the point to keep definitely in view is that the far-reaching changes of 1918 and the current year came about without a direct decision being reached by either government or the people on the underlying principle. Nobody may say at this moment that the judgment of either

the Administration or the voters of Canada has been declared in favor of or against state ownership of railways as distinct from corporate ownership. Whatever may happen in that regard in the future, scarcely a single aspect of the whole matter has been presented as a clear-cut issue. Certainly neither what has been done or may be done has as yet come before the people at large as a question of public versus private control of railways.

The Military Railway*

RAPID TRANSPORTATION to the front, both of food and munitions, was made largely over narrow-gage military railways, thousands of miles of which were furnished by this company for use in France by the French Government from the beginning of hostilities, and also by the United States Government for the American Expeditionary Forces after our entrance into the war.

The French track was ordered mostly in sections 5 metres long, or approximately 16 ft. 4 in. and in 60 centimetre gage, which is slightly less than 2 ft. The weight of the French rail was approximately 20 lb. to the yard of single rail and the American 25 lb. to the yd. Eight pressed steel ties were riveted to the 5-metre lengths of French track, while American practice bolted the ties to the rail so that it could be packed knocked down to save shipping space. Although most of the track was in 5-metre lengths, many longer and shorter sections were used, all, however, in multiples of $2\frac{1}{2}$ metre, accurately sawed so as to insure absolute fit of intermediate sections when shell fire necessitated replacement. Vast quantities of curved track were also specified as well as innumerable switches and turnouts. After the track was unloaded at the French port it was shipped over standard gage railroads to points close to the war zone. Here it was either stacked up according to length of sections to await requisitions from the Engineer Corps, or sent at once to the front. The necessary splice bars and bolts accompanied the track, so that the Engineer Corps were able to lay it quickly ready for use.

The "Stars and Stripes," the official newspaper of the American Expeditionary Forces, published in France, in a recent issue devotes much space pertaining to the contests which were held by the engineers in laying narrow gage track which had been shipped overseas unassembled to save shipping space. Remarkable results in distance of track laid per day were obtained by these contests, always friendly. Teams were composed of 12 men each, working in pairs. Six men bolted the ties to the rails, while the other six men, acting as helpers, supplied the necessary ties, splice bars, clips and bolts as fast as needed.

One contest started by two rival teams began at 7 o'clock in the morning and ran all day without let-up, in spite of raw winds and drizzling rains. One of the teams had not tasted defeat in track laying since it arrived in France 15 months earlier. But it had a strong rival this day.

"With the first defeat seemingly inevitable they became desperate. As the time for the finish grew shorter the two teams were neck and neck, but at the close they were the winners in a grandstand finish that equalled any uphill fight ever staged on the Polo Grounds in New York in ante-bellum days."

They had laid 280 sections, or about 4,572 feet of track, while their rivals were a close second with 279 sections, losing out by just one section, or approximately 161.3 feet. Officers had promised a feast for the winners, but the race was so close both teams were invited to the celebration that night in the mess hall.

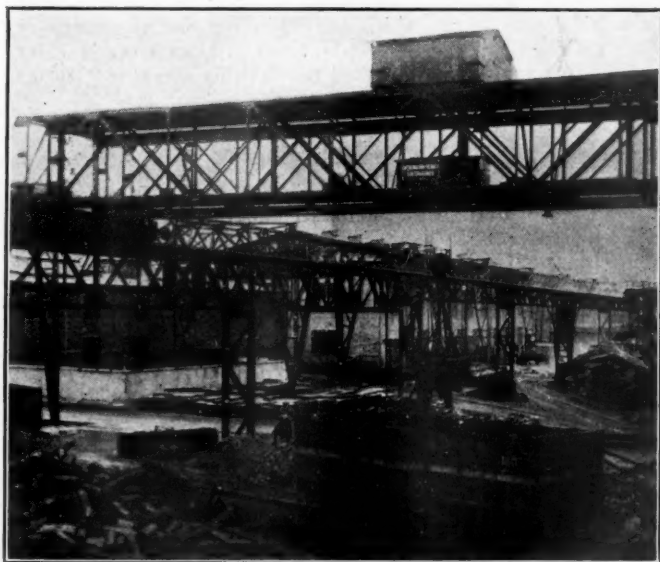


Photo from Central News

Breaking-Up Shells at a German Manufacturing Plant

* Reproduced from "The Road to Peace," recently issued by the Lakewood Engineering Company, Cleveland, Ohio.

General News Department

The Artesian Belt Railroad, connecting Macedonia and Christine, Tex., a distance of 42¼ miles, was sold at auction on June 3, for \$150,000, to Harry Landa and associates, who will continue operation. They plan to make improvements in the near future.

Seven employees of the Kanawha & Michigan at Hobson, Ohio, have been arrested by railroad detectives, following the investigation of thefts of thousands of dollars worth of merchandise from freight cars in the yards at Hobson. The reports say that one of the men has signed a confession implicating the other six.

The shopmen of the Norfolk & Western of whom, according to the newspapers, a large number have been on a short strike, agreed with officers of the United States Railroad Administration on June 13 to go back to work this week Monday. Their chief grievance was the alleged unfair discharge of certain men. In the negotiations the shopmen were represented by officers of the American Federation of Labor.

Three hundred shop employees of the Southern Railways at Alexandria, Va., went out on strike on June 17 by way of protest against what they term the delay in passing on the proposed uniform rules and working conditions and also the general demand of the shop employees for an advance in wages which have both been before the Board of Wages and Working Conditions for some time. The strike was unauthorized and the men were persuaded to return to work later in the day.

Governor Frank O. Lowden of Illinois, and State Director of Finance Omar Wright have been exonerated of charges made by W. H. Malone, a member of the State Board of Equalization, of tampering with the State Board of Equalization over its assessment of the Pullman Car Company, in the original draft of the report of the legislative committee appointed to investigate the charges. Mr. Malone charged that the governor and Mr. Wright threatened to abolish the board if the Pullman company assessment was not reduced.

The Voluntary Relief Department of the Pennsylvania Lines West of Pittsburgh for the 18 months ending December 31, 1918, reports total receipts of \$1,942,551 and total disbursements \$1,834,449. During this 18 months there has been paid \$252,866 for expenses of the relief department out of the railroad treasury. The number of death and disablement benefits paid during the 18 months was 32,444, of which 182 were deaths due to accidents and 12,928 disablements due to accidents. The total membership of the Department on December 31, 1918, was 52,780.

The use of heavy guns on railroad cars is engaging the attention of officers of the War department at Washington in connection with their studies of the defenses of the Chesapeake bay district. Coast artillery officers are now conferring with railroad officers regarding the practicability of constructing permanent spurs from the main lines to the coast around Chesapeake bay. The vicinity of Roanoke, Va., is also being studied in connection with its importance to the defense of the National Capital. Several heavy howitzers and rifles mounted on cars already are available, other units are under construction and still others will be brought back from France.

Fines aggregating \$8,000 were recently imposed upon three railroad companies, namely, the Michigan Central, the Grand Trunk and the Wabash, by Judge Arthur J. Tuttle, in the federal court at Detroit, Mich. The Michigan Central was fined \$6,700 for violation of the law requiring that cattle be taken from cars seasonably for watering and feeding. This

fine covered violations from 1911 to about 1914 and the amount represented part of a large number of suits, approximately 475, commenced at Detroit and also at Buffalo, N. Y. The Grand Trunk was fined for not having air brakes properly repaired and for not having sufficient grab irons on cars; and the Wabash company was fined for the same offense.

The triennial convention of the Brotherhood of Locomotive Firemen & Enginemen opened at Denver, Colo., on June 9 with approximately 900 delegates present and will continue in session for approximately a month, during which the average attendance is expected to be approximately 2,500. Among the questions which it is understood will be discussed by delegates to the convention are those of federal control of the railroads, the attitude of the Brotherhood toward a solution of the railway problem, and the matter of wages of railroad firemen and engineers. Among the first resolutions adopted by the Brotherhood were ones endorsing the League of Nations and requesting the release from prison of Eugene V. Debs and Thomas J. Mooney.

Safety-first campaigns will be begun in both the Central Western and the North Western regions on June 22, and will continue through June 28—seven days. The government operated railroads in these two regions aggregate about 104,000 miles of line, or about two-fifths of the mileage of the country. The campaigns will be under the direction of H. A. Adams, in the Central, and H. J. Bell in the North Western region. The two campaigns will concern approximately 550,000 railroad men. The men in these regions operate roughly 700,000 freight cars, 21,000 locomotives and 17,000 passenger cars, or 30 per cent of the total railway equipment of the United States. So far as practicable personal appeals will be made to every employee to equal or better the records made in similar campaigns in other regions.

Eight Miles of Belting

The B. F. Goodrich Rubber Company, Akron, Ohio, recently shipped to the Pennsylvania Railroad, 44,254 ft. of rubber belting for use in its new grain elevator at Camden (Baltimore). This shipment included 32-in. and 38-in. widths for belting, and 36-in., 42-in. and 48-in. for use in conveyors. The capacity of one of the 48-in. horizontal carriers is 35,000 bushels an hour. It is expected that at this elevator 2,000,000 bushels of grain can be loaded daily.

The Trouble Begins

Today (June 20) is the last day for shipping whisky by railroad, according to a Cincinnati paper, which says that a notice to that effect has been sent to distillers and wholesalers by the United States Railroad Administration. It is said that more than a third of outbound shipments from Louisville are whisky; for the last week freight houses have been packed with liquor. "All whisky going out now must have freight prepaid so that railroads will not be the loser if the goods arrive at their destination after the curtain falls, July 1."

The International Fuel Association

The report of discussion of F. H. Hammill's paper on fuel economy appearing in the article on the Eleventh Annual Convention of the International Railway Fuel Association as given on page 1254 of the *Railway Age* of May 23 referred to a statement by A. D'Heur of the Southern Pacific. This is incorrect as the speaker was Thomas Ahern, division superintendent of the Coast division, Southern Pacific. The division fuel oil meetings there referred to are attended by em-

ployees from all departments, as they can be spared. Engineers and firemen attending these meetings are selected because they have the best fuel records, as shown by performance sheets.

Spruce Forest Railroads to Be Sold

The Spruce Production Corporation announces at Portland, Ore., that the extensive forests bought by the government last year with a view to supplying lumber for airplanes, together with the railroads built to get at this lumber, will be soon advertised for sale. The timber area amounts to hundreds of square miles, and the length of completed railroad is more than 75 miles. About half of this railroad is on the Olympic peninsula in Clallam county, Washington, and grading has been done on many miles of short spurs. There are also long pieces of railroad in Oregon.

Winnipeg Strike

With the arrest of 10 of Winnipeg's general strike leaders on June 17 on charges of making seditious statements, the situation at Winnipeg is less tense, and it is expected that the difficulties between employees and metal trade workers, in whose support the general strike was called, will soon be adjusted. The "labor temple," from which the strike has been conducted, was raided by the police and considerable literature confiscated.

Members of the Winnipeg lodges of the firemen's and brakemen's brotherhoods have voted to join in a sympathetic strike unless certain demands of the local unions are met. The executive officers of both brotherhoods immediately declared that the action of the Winnipeg locals was unauthorized and that union men would be used to replace the "illegal strikers." The railroad brotherhoods acting as mediators did not accomplish any definite results. Train service in and out of Winnipeg has been maintained, and with the exception of a few suburban trains the service has not been curtailed in any manner during the strike.

James Peak Tunnel Proposed

Mayor Dewey C. Bailey, Denver, Colo., has recently made a proposal to the Denver Civic & Commercial Association to create a six million dollar corporation to complete the tunnel under James Peak for the Denver & Salt Lake independent of state aid. In making his proposal Mayor Bailey promised city aid in promoting the new company and proposed to ask the citizens of Denver to vote bonds to build the tunnel.

The Colorado legislature at its last session authorized the appointment of a special commission to prepare plans for submission to the voters of a bond issue to complete the tunnel. Mayor Bailey's proposal was based on the supposition that the southern part of the state would not support a plan to vote bonds by the state to build this tunnel for the Moffat road, whereas Denver is directly interested in this project because of the great business which otherwise would be diverted to Wyoming, Omaha, Neb., and Salt Lake, Utah. President W. D. Hodges of the Denver Civic & Commercial Association, promised to back the campaign, which will probably start about September 1.

The Franco-American Tongue

A correspondent in France sends us the following extract from an Anglicized report, received from a French superintendent, replying to correspondence about carelessness or neglect on the part of a certain engineman. Superintendents and others who do not feel themselves 100 per cent proficient in correspondence may perhaps learn a point or two from this translator. The incident referred to was the derailment of a tender, the engineman of Engine 1242, coupled to the rear of Engine 1579, putting on steam at the wrong moment and derailling the tender of 1579, as they were entering a side track.

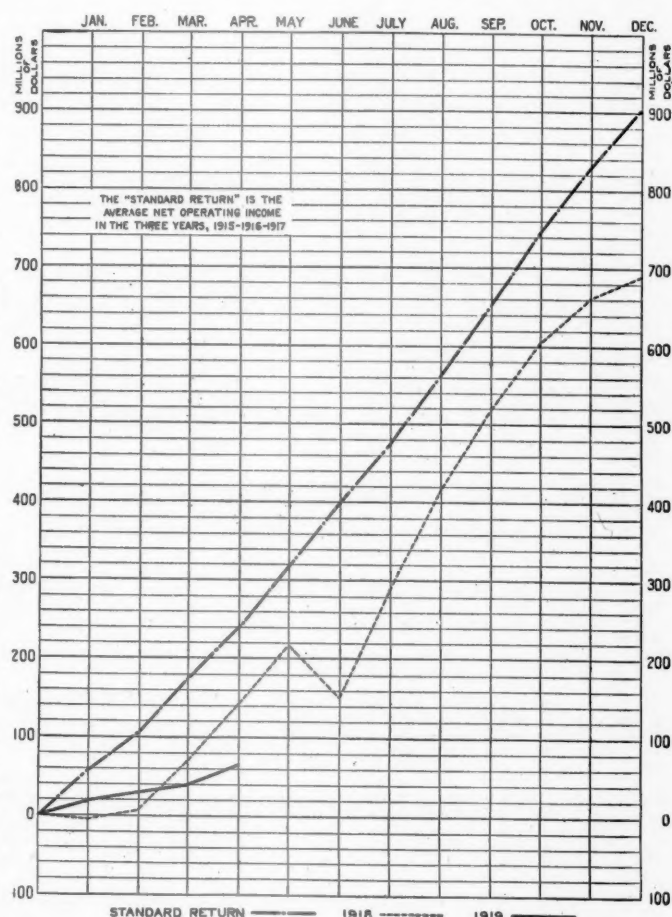
"In reference to the correspondence exchanged—your note No. 580 DM.—concerning the derailling of the machine USA 1242, on the heart of switch 328 . . . according to the

investigation to which we proceeded, it follows that the engineman of the machine 1242, which was joined to machine 1579, had opened his regulator just as he was about to engage the center of the crossing. This operation, causing pressure of the first machine, uplifted slightly the front axle of the machine 1242 and enabled it, thanks to a curve of 280 mm. (eleven inches!) diameter to take the tangent and to engage itself in the groove preceding the frog.

"As we have no regulation whatever, in case of a double draw-gear, forbidding the engineman of the second engine to open his regulator, when the operation is necessary, the responsibility of the engineman, at machine 1242, cannot be looked for. . . ."

Net Operating Income

The chart made by the Bureau of Railway Economics shows the net operating income of the Class I Roads in 1919, compared with the average in the test period (1915-1916-17)



Net Operating Income, Cumulated by Months, 1918 and 1919 Compared with Standard Return, Class I Railways of United States

on which government rental is based. The table gives the figures on which the chart is based.

Month	Average net operating income (standard return) in 3-year test period		Net operating income earned in 1919		Deficit in 1919	
	By months	Cumulative	By months	Cumulative	By months	Cumulative
Jan...	\$56,613,000	\$56,613,000	\$18,783,702		\$37,830,000	
Feb...	47,934,000	104,547,000	10,106,268	\$28,889,970	37,828,000	\$75,658,000
March...	68,251,000	172,798,000	10,842,608	39,660,778	57,409,000	133,067,000
April...	67,289,000	240,087,000	26,115,214	65,916,807	41,174,000	174,241,000
May...	77,385,000	317,472,000				
June...	82,550,000	400,022,000				
July...	75,341,000	475,363,000				
August...	86,860,000	562,223,000				
Sept...	91,273,000	653,496,000				
Oct...	94,333,000	747,829,000				
Nov...	83,536,000	831,365,000				
Dec...	73,282,000	904,647,000				

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL, 1919—CONTINUED FROM LAST WEEK

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equip. ment.	Traffic.					
Houston, East & West Texas.....	190	\$130,620	\$38,046	\$178,401	\$33,319	\$22,771	\$1,018	\$92,444	\$4,556	\$154,610	\$6,158	\$23,791
Illinois Central.....	4,787	5,799,872	1,796,937	8,015,774	1,490,374	2,268,997	90,351	3,944,502	233,265	8,098,130	396,000	480,047
Indiana Harbor Belt.....	116	.....	.....	453,335	93,150	334,185	2,029	304,394	118,653	534,094	9,954	90,716
International & Great Northern.....	1,159	793,013	220,975	1,092,233	282,400	339,480	13,241	617,175	42,961	1,302,247	30,000	240,105
Iowa & Michigan.....	176	266,931	69,242	351,595	33,991	98,738	2,666	113,662	12,363	261,419	17,885	72,290
Kansas City, Mex. & Orient.....	275	95,705	22,317	123,633	38,180	34,859	986	54,070	7,865	135,963	6,250	18,580
Kansas City Southern.....	465	64,370	12,185	81,986	32,610	36,636	1,041	60,147	7,658	138,092	4,920	61,026
Kansas City Terminal.....	774	890,971	171,766	1,047,678	217,193	239,832	21,505	478,097	45,163	997,516	88,222	31,988
Lake Erie & Western.....	902	614,056	59,046	706,788	116,446	238,337	12,006	339,008	24,116	729,594	28,500	7,811
Lake Superior & Ishpeming.....	34	3,804	250	5,017	20,927	20,291	192	9,948	2,598	53,956	2,560	51,499
Lehigh & Hudson River.....	96	168,740	4,915	181,098	22,674	37,422	1,556	77,236	10,251	170,799	3,140	18,844
Lehigh Valley.....	229	273,210	7,716	280,881	40,667	67,728	1,556	88,640	10,251	270,630	8,910	35,419
Long Island R. R. K.....	1,435	3,933,446	700,789	5,185,033	751,293	1,257,081	51,639	2,452,065	105,727	4,333,268	146,725	324,442
Los Angeles & Salt Lake.....	398	507,319	1,269,604	1,985,633	262,299	276,476	12,731	925,014	47,153	1,533,514	85,804	361,484
Louisiana Ry. & Navigation.....	1,168	1,085,274	335,495	1,507,113	295,246	269,178	16,422	461,334	29,506	1,107,122	67,235	332,770
Louisiana & Arkansas.....	349	231,462	32,380	280,051	91,966	43,637	3,483	138,630	7,136	284,852	14,000	18,835
Louisiana Western.....	302	133,921	32,261	172,224	32,694	36,343	3,153	71,122	5,670	149,882	11,571	10,671
Louisville & Nashville.....	207	201,511	99,980	318,815	37,954	61,714	3,734	81,505	10,558	197,433	9,070	112,254
Maine Central.....	5,013	6,271,861	1,852,179	8,099,945	1,383,851	2,250,497	116,309	3,397,120	200,984	7,347,536	246,776	1,005,785
Maine, Henderson & St. L.....	199	157,602	58,655	228,213	63,566	37,877	6,331	95,692	6,995	210,460	4,000	13,649
Maine, Central & St. L.....	1,216	888,896	378,592	1,385,944	284,247	332,652	10,449	777,075	33,517	1,438,919	75,623	128,609
Maryland, Delaware & Va.....	82	70,590	30,312	103,994	8,244	22,943	505	73,179	1,954	107,365	1,733	5,104
Michigan Central.....	1,861	3,613,573	1,567,869	5,757,070	807,852	1,173,180	70,400	2,224,104	111,454	4,449,519	160,000	1,146,820
Midland Valley.....	368	218,922	80,520	307,301	70,441	58,927	3,414	115,365	12,294	260,442	6,786	39,953
Mineral Range.....	101	69,326	494	72,774	8,867	23,016	772	37,796	1,043	71,526	3,300	2,552
Minneapolis & St. Louis.....	1,646	748,631	200,413	1,007,539	227,999	298,666	10,272	474,120	28,674	1,033,758	51,371	83,587
Missouri, St. Paul & Sault Ste. Marie.....	4,243	2,302,716	591,135	3,131,747	551,173	754,096	25,829	1,316,355	77,689	2,710,067	187,703	233,049
Minn. & International.....	124	68,560	23,599	96,010	13,644	14,747	6,691	46,523	7,529	88,668	3,325	2,538
Missouri & North Arkansas.....	164	49,901	25,839	73,354	18,066	28,269	1,072	40,761	5,299	94,097	3,252	2,669
Missouri, Kansas & Texas.....	365	73,436	13,168	77,919	58,321	33,618	2,967	66,852	6,493	168,175	6,242	56,504
Missouri, Oklahoma & Gulf.....	1,713	1,815,265	586,042	2,565,830	477,197	752,914	30,353	946,354	73,453	2,286,129	90,359	189,237
Missouri Pacific.....	332	76,791	15,704	101,505	48,094	50,551	1,974	69,539	7,269	177,607	8,500	37,362
Missouri, Kansas & Texas Ry. of Texas.....	7,108	4,898,545	1,668,821	6,868,821	1,310,912	1,597,576	101,110	2,878,980	208,252	6,125,978	266,393	473,989
Montclair R. R.....	1,796	1,214,849	387,012	1,944,486	385,679	347,451	20,444	962,955	69,847	1,801,377	47,828	94,801
Montreal R. R.....	54	104,760	1,566	111,367	22,877	63,912	1,028	25,732	6,467	120,020	2,286	10,939
Mobile & Ohio.....	997	972,117	174,260	1,214,250	234,728	442,970	27,001	571,671	40,142	1,316,739	55,174	157,681
Monongahela Ry.....	108	197,082	18,728	278,920	70,402	33,127	1,028	79,143	6,003	109,825	5,000	24,216
Monongahela Connecting.....	6	.....	.....	99,350	15,474	38,545	510	48,831	6,464	109,825	2,566	13,042
Morgan & Louisiana & Texas R. R.....	400	346,365	159,541	546,760	98,757	124,988	7,205	282,114	22,348	526,262	31,034	23,940
Nashville, Chattanooga & St. L.....	1,247	1,062,541	426,952	1,599,324	281,472	369,132	32,244	621,933	44,278	1,358,015	50,000	191,168
Nevada Northern.....	168	97,535	8,695	110,529	17,377	23,800	1,240	81,544	4,541	115,544	18,323	10,662
New Orleans & N. E.....	409	347,832	103,335	517,101	101,339	112,344	9,575	255,646	12,213	493,159	28,357	24,171
New Orleans Great Northern.....	284	142,139	41,115	190,609	40,856	46,444	2,391	74,698	8,776	127,481	9,100	7,988
New Orleans, Texas & Mex.....	191	108,171	34,561	151,570	46,519	35,956	2,899	48,176	6,631	141,761	10,000	1,190
New York Central.....	6,075	13,339,550	6,347,564	22,701,274	2,977,648	5,353,397	222,661	10,505,262	599,354	20,058,134	1,281,216	3,235,380
New York, Chicago & St. L.....	574	1,700,255	214,649	1,960,898	232,603	384,514	25,571	768,001	47,692	1,462,416	55,000	443,481
New York, N. H. & Hart.....	1,965	3,442,938	3,641,285	8,118,784	1,106,843	1,571,505	43,999	4,086,149	245,941	7,176,786	268,000	672,711
New York, Ont. & Western.....	569	485,114	115,300	725,653	119,913	211,041	8,629	371,858	20,260	731,700	24,700	30,751
New York, Phila. & Norfolk.....	121	485,464	130,729	639,208	53,221	104,860	9,073	300,711	11,127	533,306	17,646	88,257
New York, Susq. & Western.....	135	212,411	51,618	314,571	33,957	49,181	1,977	220,359	9,066	314,514	37,111	37,078
Newburgh & South Shore.....	7	.....	.....	151,304	21,499	27,565	.....	64,620	3,671	117,355	8,145	23,804
Norfolk Southern.....	907	337,873	136,623	511,270	119,087	122,103	7,451	246,901	21,297	517,515	19,990	25,804
Norfolk & Western.....	2,088	4,979,175	865,206	6,189,619	792,070	1,024,103	33,101	2,184,662	110,040	5,084,683	260,000	106,483
Norfolk & Albemarle.....	112	66,565	11,946	80,692	27,056	8,970	1,343	40,547	1,670	79,459	3,400	2,167
Northern Pacific.....	6,568	5,756,736	1,435,019	7,747,573	1,580,761	1,355,259	54,901	2,803,646	192,464	6,304,384	647,124	1,064,275
Northwestern Pacific.....	6,307	224,367	175,670	454,440	79,985	70,433	4,355	197,591	13,097	367,818	32,090	64,451
Oregon Short Line.....	2,347	2,099,979	518,414	2,823,799	726,504	441,798	13,332	836,751	95,704	2,168,260	177,964	477,491
Oregon-Wash. R. R. & Nav.....	2,069	1,388,998	473,459	2,049,451	441,134	257,796	25,127	803,056	92,461	1,745,788	113,614	189,802
Panhandle & Santa Fe.....	2,772	299,553	90,458	413,999	145,318	158,663	3,663	227,192	14,769	545,695	15,604	147,417
Pennsylvania R. R. Western Lines.....	1,754	5,809,623	1,658,455	8,068,487	1,052,530	2,248,862	80,577	3,402,779	183,001	7,026,055	307,737	734,549
Pennsylvania R. R., East.....	5,360	18,278,793	7,743,288	28,413,269	3,962,189	7,975,466	290,274	12,513,981	723,245	25,994,239	920,335	1,498,266
Pennsylvania R. R., West.....	41	81,194	8,810	92,978	7,156	13,593	13	28,713	280	36,199	1,800	54,979
Pere Marquette.....	2,232	2,060,931	424,236	2,690,532	15,992	38,564	849	67,642	5,413	128,459	9,500	43,767
Pitts. & Reading.....	1,127	4,203,280	959,524	5,471,390	764,416	1,407,948	37,225	2,788,860	132,994	5,149,674	143,228	178,488
Pitts. & Lake Erie.....	224	1,600,238	201,922	1,963,786	555,839	614,846	13,408	720,506	42,400	1,948,118	75,200	59,835
Pitts. & W. Va.....	63	77,716	9,140	100,236	82,865	39,152	1,673	45,939	5,015	184,230	11,446	95,446
Pitts., Bethlehem & N. England.....	71	.....	.....	52,598	4,487	12,499	373	36,625	2,950	54,934	1,050	3,386
Pitts. & Shawmut.....	103	79,568	3,951	84,474	31,590	41,926	2,094	38,197	3,102	115,238	979	31,724

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL, 1919—CONCLUDED

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Maintenance of equip- ment.	Traffic.	Trans- portation.						
Pitts., Cin., Chic. & St. Louis.....	2,383	\$5,618,320	\$1,494,746	\$7,113,066	\$913,107	\$2,286,229	\$82,516	\$3,280,645	\$6,802,023	87.05	\$1,011,259	\$243,016	\$767,934	—\$226,520
Pitts., Shawmut & Northern.....	204	78,102	6,027	84,129	19,886	49,162	1,170	35,786	111,560	128.56	—24,787	—26,620	—26,620	8,464
Port Reading.....	21	106,557	23,938	130,495	23,120	9,195	18	80,767	306	113,406	48.47	9,000	—25,538	—24,550
Quincy, Omaha & Kansas City.....	255	61,325	23,481	84,806	24,802	24,802	173	42,882	113,860	124.76	—22,600	2,910	—25,538	—27,942
Rich., Fred. & Pot.....	77	224,185	291,248	515,433	97,873	94,936	4,943	219,426	443,877	78.57	121,005	—11,810	109,192	—36,517
Rutland R. R.....	415	231,466	104,074	335,540	64,091	95,581	5,806	200,578	377,185	93.79	24,967	19,059	5,906	—67,082
St. Joseph & Grand Island.....	258	147,100	44,226	191,326	50,654	73,977	4,076	122,077	224,731	108.87	18,282	18,811	—27,093	—23,870
St. Louis, Brownsville & Mex.....	548	263,471	118,220	381,691	60,688	71,307	4,044	132,071	236,513	69.64	124,860	10,000	114,860	37,595
St. Louis Merchants Bridge Terminal.....	9	6,000	600	6,600	60,688	43,355	7,733	175,921	286,307	138.95	—80,207	8,000	—88,207	—126,746
St. Louis, San Fran. & Texas.....	4,761	3,981,301	1,568,125	5,549,426	1,043,373	1,134,353	48,631	2,148,334	4,515,603	77.11	1,340,255	278,332	1,061,923	38,187
St. Louis, Southwestern.....	134	100,656	4,718	105,374	23,257	21,042	2,213	65,593	10,477	108.20	—9,293	1,629	—10,939	—69,201
St. Louis, Southwestern Ry. of Texas.....	939	781,187	163,436	944,623	160,087	214,242	15,191	277,324	35,962	71.37	283,181	44,829	238,352	—327,950
San Antonio & Aransas Pass.....	814	295,673	97,609	393,282	107,161	165,930	8,919	243,498	23,945	127.76	—119,196	21,000	—140,196	—109,241
Seaboard Air Line.....	732	189,738	78,231	267,969	88,577	116,719	5,454	200,162	16,114	144.35	—131,179	15,000	—146,956	—164,391
Seaboard Air Line.....	3,563	2,059,722	995,555	3,055,277	516,387	726,525	68,050	1,582,031	109,427	90.25	327,372	135,000	192,372	—418,464
St. Louis Transfer.....	6	.....	.....	70,824	11,350	10,381	186	34,930	58,867	83.11	11,956	100	11,856	—3,443
South Buffalo.....	11	27,538	2,926,169	3,003,707	42,444	9,141	305	42,776	38,427	61.53	24,017	2,550	21,467	—55,377
Southern Ry. in Mississippi.....	6,983	6,363,120	1,110,424	7,473,544	1,921,192	2,526,282	123,244	4,329,576	277,923	91.71	838,170	322,263	516,907	—2,776,540
Southern Pacific.....	278	81,168	40,706	121,874	131,637	24,121	2,543	83,111	155,415	118.06	23,778	9,000	32,778	—36,714
Southern Pacific.....	7,049	8,057,021	3,355,272	11,412,293	2,258,650	2,830,823	107,565	5,137,840	282,754	86.85	1,639,241	631,133	1,008,108	—1,628,467
Spokane International Ry. Lines.....	156	56,595	16,421	73,016	20,343	7,897	1,602	28,519	4,031	82.58	13,034	7,932	5,102	—26,983
Southern Pacific Steamship.....	36	95,602	15,591	111,193	10,733	250,817	11,320	652,087	21,886	103.74	34,201	10,850	23,351	—221,848
Spokane, Portland & Seattle.....	469	439,174	167,212	606,386	116,933	167,435	5,593	222,331	13,108	82.95	112,648	21,086	91,562	—92,290
Texas & Pacific.....	1,946	1,836,554	710,592	2,547,146	391,643	548,190	2,825	1,284,536	2,338,657	86.35	369,547	284,379	85,168	—156,619
Toledo & Ohio Central.....	435	499,651	61,218	560,869	201,740	123,355	3,215	263,567	16,922	103.70	—21,850	31,056	—52,908	—90,018
Toledo, Peoria & Western.....	247	87,331	44,809	132,140	32,181	45,440	2,438	67,343	5,912	109.29	—13,043	8,500	—21,543	—13,004
Toledo, St. L. & Western.....	454	561,106	20,145	581,251	104,160	123,369	4,944	245,482	11,547	79.08	129,488	26,000	103,488	—121,463
Trinity & Brazos Valley.....	368	70,161	20,145	90,306	34,490	38,007	1,731	55,012	7,380	143.29	—41,276	5,715	—46,991	—54,890
Ulster & Delaware.....	128	71,450	6,282	77,732	9,452	20,298	1,317	94,223	4,723	127.19	—26,772	5,400	—32,172	—35,078
Union R. R.....	35	612,679	1,747,423	2,360,102	612,679	1,747,423	234	327,935	7,762	97.62	14,560	6,428	8,132	—49,635
Union Pacific.....	3,614	5,738,998	1,747,423	7,486,421	1,498,704	1,827,937	53,886	2,244,303	5,735,856	70.19	2,435,731	275,316	2,160,415	—184,329
Utah Ry. & N. W.....	171	62,254	13,438	75,692	3,780	3,780	205	14,538	1,867	51.91	30,955	4,088	26,867	—20,967
Utah Ry., Shreveport & Pacific.....	499	558,367	667,705	1,226,072	230,840	37,644	3,712	92,934	198,341	82.69	41,999	9,417	32,582	—21,957
Virginian Ry.....	2,519	2,508,816	772,315	3,281,131	676,851	529,468	56,912	1,953,966	113,060	86.32	830,660	108,887	721,773	—326,110
Washington Southern.....	35	93,455	182,059	275,514	44,905	43,620	1,931	121,650	5,957	72.93	83,659	6,870	76,789	—36,761
West Jersey & Seaboard.....	361	271,600	501,892	773,492	191,873	191,873	8,916	479,148	21,079	104.37	—36,407	51,605	—88,012	35,609
Wichita Falls & N. W.....	328	106,229	34,927	141,156	50,862	32,329	1,863	109,139	8,731	17.507	—52,744	9,256	—62,000	—24,787
Western Maryland.....	707	956,671	73,878	1,030,549	188,663	387,456	16,610	460,340	41,878	98.42	17,768	43,200	—25,432	—66,445
Western Pacific.....	1,011	632,818	155,069	787,887	254,925	178,188	9,846	312,491	25,999	95.80	34,879	48,231	—13,359	—270,242
Western Ry. of Alabama.....	133	139,510	82,598	222,108	25,607	47,504	2,956	77,152	163,049	69.12	72,824	7,500	65,324	—4,109
Wheeling & Lake Erie.....	511	816,361	58,293	874,654	219,314	204,805	5,896	376,984	23,911	86.59	128,954	54,200	74,754	37,465
Yazoo & Miss.....	1,381	1,310,272	391,461	1,701,733	339,689	427,891	18,180	802,114	47,699	90.83	164,717	68,066	96,651	—344,403
Alabama & Vicksburg.....	141	601,293	235,514	836,807	146,242	228,992	6,900	395,411	34,161	91.56	75,247	42,540	32,697	—116,482
Ala. Great Southern.....	312	2,335,875	670,332	3,006,207	379,068	883,796	50,623	1,388,063	69,924	87.32	404,015	98,244	305,771	—350,532
Ann Arbor.....	301	997,673	206,779	1,204,452	274,262	223,989	14,261	600,676	47,776	71.38	109,408	59,600	49,808	—18,236
Arizona Eastern.....	377	972,408	190,848	1,163,256	1,348,133	328,990	6,413	410,234	27,490	78.83	264,141	65,128	198,940	—366,467
Atch., Topeka & Santa Fe.....	8,635	34,946,341	13,475,138	48,421,479	7,550,223	12,176,918	563,359	19,682,115	1,036,435	80.29	10,535,191	2,210,064	7,313,916	—4,673,472
Atlanta & W. Point.....	93	448,472	366,837	815,309	168,620	165,538	11,627	328,543	25,092	71.52	256,673	34,000	222,673	—22,249
Atlantic, Birm. & At.....	639	1,182,815	280,671	1,463,486	480,631	543,154	26,236	946,713	50,132	131.31	—488,102	64,000	—552,971	—539,311
Atlantic City.....	177	489,025	505,295	994,320	170,743	164,874	3,785	992,682	3,295	92.56	79,735	48,000	31,735	36,461
Atlantic Coast Line.....	4,875	14,408,011	7,166,952	21,574,963	3,152,429	4,581,470	239,252	9,800,061	433,865	79.91	4,614,832	820,000	3,794,832	—1,385,822
Balto. & Ohio Chie. Terminal.....	91	.....	12	472,126	135,676	183,539	4,268	489,661	875,750	185.49	—403,624	116,837	—520,466	—136,511
Balto., Ches. & Atl.....	5,145	36,341,078	9,938,455	46,279,533	8,509,882	17,914,779	617,291	25,225,611	1,605,539	108.07	—4,054,701	1,454,992	—5,514,691	—3,417,855
Balt., Ches. & Atl.....	87	267,673	118,464	386,137	44,499	75,827	3,729	259,255	13,655	99.47	2,105	12,640	—10,534	—34,471
Barnum, So. Lake & Western.....	632	1,437,711	294,584	1,732,295	366,884	431,548	15,609	714,410	1,602,738	88.53	207,629	84,000	123,629	—90,045
Beaumont, Sour Lake & Western.....	118	326,573	90,280	416,853	95,359	77,674	6,803	191,114	20,904	89.85	44,218	10,800	33,378	—204,900
Belt Ry. Co. of Chicago.....	31	.....	.....	961,095	83,378	200,317	1,197	694,391	1,011,168	105.20	—50,073	62,536	—112,609	—88,955
Bessemer & Lake Erie.....	217	2,620,628	133,481	2,754,109	1,212,683	41,132	1,199,990	86,540	2,805,738	97.86	61,186	58,000	3,186	83,078
Birmingham & Gulf.....	57	411,558	161,222	572,780	129,121	159,021	6,023	126,823	13,001	100.52	—3,642	24,927	—28,569	—452,288
Birmingham Southern.....	37	163,325	227,319	390,644	147,666	135,860	13,754	256,560	13,084	68.72	17,089	11,404	58,972	—43,955
Boston & Maine.....	2,258	11,669,384	6,390,602	18,060,000	2,684,889	4,456,449	151,400	12,041,711	676,366	92.03	196,912	693,776	—497,119	—51,070
Buff. & Susq. R. R. Corp.....	296	620,352	29,391	649,743	157,204	328,533	7,226	247,624	29,221	115.44	—102,959	13,000	—115,959	—186,740

FOUR MONTHS OF CALENDAR YEAR, 1919

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF CALENDAR YEAR, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operation.	Railway income (or loss).	Increase (or decr.) comp. with last year.	
		Freight.	Passenger.	(inc. misc.).	Maintenance of way and structures.	Equipment.	Traffic.						Transportation.
Buff. Roch. & Pitts.....	589	\$3,822,803	\$4,787,765	\$4,449,185	\$671,644	\$1,570,018	\$57,335	\$4,724,247	106.18	—\$275,061	\$108,000	—\$383,503	—\$465,047
Canadian Pacific Lines in Maine.....	233	991,537	267,115	1,258,652	135,155	315,872	10,321	868,941	102.69	—35,322	44,000	—79,386	—77,386
Carrollton, Cinchfield & O.....	282	1,643,765	119,177	1,762,942	328,208	454,343	17,551	1,468,206	81.74	327,881	65,000	—262,669	—101,678
Central New England.....	301	1,683,138	97,023	1,780,161	416,411	456,016	9,734	1,066,973	106.66	—125,094	64,000	—189,070	—435,929
Central of Georgia.....	1,918	4,020,320	1,934,599	5,954,919	1,361,441	1,530,431	13,618	2,963,167	92.48	504,841	219,362	284,437	—1,586,439
Central R. R. of New Jersey.....	684	9,738,745	2,341,699	12,080,444	1,561,214	3,618,235	82,395	6,597,160	92.98	923,426	629,899	303,371	—444,907
Central Vermont.....	411	1,163,062	317,025	1,480,087	1,045,504	400,580	24,111	1,111,544	114.43	—239,692	69,600	—308,808	—150,061
Chesapeake & Western Carolina.....	2,496	15,834,641	4,541,871	20,376,512	3,536,677	5,033,214	150,037	8,760,898	85.17	1,554,675	34,000	1,220,675	—746,124
Chesapeake & Ohio.....	1,030	5,431,498	1,865,362	7,296,860	1,263,415	2,097,821	99,363	3,481,433	92.21	602,223	226,706	374,939	—105,985
Chicago & Alton.....	1,131	5,381,592	1,521,195	6,902,787	1,217,809	2,996,019	91,204	3,499,656	107.55	—563,177	318,092	—882,917	—972,058
Chicago & Eastern Ill.....	269	2,661,513	325,534	2,987,047	363,441	630,772	41,487	1,774,428	90.54	306,450	128,573	177,803	495,121
Chicago & Erie.....	8,090	25,434,777	10,067,678	35,502,455	5,305,197	8,836,527	294,194	19,833,100	91.77	3,186,950	1,900,000	1,286,950	—26,475
Chicago & Northwestern.....	9,372	31,606,007	9,830,701	41,436,708	6,569,635	9,186,047	350,375	18,390,884	81.18	8,385,977	1,732,705	6,653,272	—1,154,654
Chicago, Burl. & Quincy.....	9,372	31,606,007	9,830,701	41,436,708	6,569,635	9,186,047	350,375	18,390,884	81.18	8,385,977	1,732,705	6,653,272	—1,154,654
Chicago Great Western.....	1,496	4,176,206	1,798,547	5,974,753	978,038	1,636,146	105,117	3,036,752	92.88	457,409	232,948	224,461	—358,423
Chicago, Ind. & Lon.....	657	2,408,859	814,447	3,223,306	428,680	865,794	49,747	1,470,446	83.51	581,815	128,166	453,649	204,143
Chicago, Ind. & Western.....	321	609,571	188,720	798,291	168,788	273,480	16,958	503,948	114.67	—130,616	40,572	—170,988	—292,510
Chicago, Rock Island & Pacific.....	7,592	21,211,055	8,762,698	29,973,753	5,955,747	8,114,391	386,060	14,632,044	93.01	2,238,874	1,393,258	845,616	—2,992,043
Chicago, St. Paul, Minn. & Omaha.....	1,749	5,437,086	2,232,213	7,669,299	1,148,448	1,566,357	83,359	4,093,344	83.38	1,362,851	413,647	967,076	211,032
Chicago, Terre Haute & Southeastern.....	374	1,535,588	383,539	1,919,127	211,460	686,444	15,095	1,066,488	108.29	—144,253	58,000	—164,274	—19,570
Cincinnati, Lebanon & Nor.....	376	2,255,588	26,694	2,282,282	61,668	272,788	5,095	205,693	114.60	—144,253	58,000	—164,274	—19,570
Cincinnati, Ind. & Western.....	321	609,571	188,720	798,291	168,788	273,480	16,958	503,948	114.67	—130,616	40,572	—170,988	—292,510
Cincinnati, New Orleans & Texas Pacific.....	337	4,054,317	1,236,561	5,290,878	626,957	1,956,697	93,452	3,239,750	82.52	973,876	155,999	816,547	209,044
Cincinnati Northern.....	251	830,112	67,170	897,282	166,637	118,905	9,532	727,213	79.90	192,054	33,000	158,974	94,216
Cleveland, Cincinnati, Chicago & St. Paul.....	2,395	14,346,643	4,759,627	19,106,270	2,911,416	4,551,504	312,633	8,653,513	82.04	3,722,043	740,000	2,978,409	—427,064
Colorado & Southern.....	1,100	3,299,099	642,764	3,941,863	520,701	970,275	33,570	1,573,008	78.71	883,582	188,000	695,582	—266,394
Colorado & Wyoming.....	41	98,670	4,676	103,346	33,806	70,510	309	180,780	79.27	78,639	16,000	62,639	—13,703
Cumberland Valley.....	163	1,336,579	253,597	1,590,176	350,903	386,440	26,017	759,849	92.07	1,572,125	37,370	97,873	—336,796
Delaware & Hudson.....	868	8,776,462	856,484	9,632,946	1,436,152	3,109,078	71,354	4,895,167	98.90	111,745	240,000	133,946	1,372,715
Delaware, Lack. & Western.....	955	15,882,093	3,645,482	19,527,575	2,911,344	4,679,532	159,342	9,996,771	79.85	4,393,371	1,220,440	3,172,931	—430,332
Denver & Rio Grande.....	2,629	6,976,229	1,668,886	8,645,115	1,232,302	3,408,342	71,863	3,408,178	87.08	1,181,302	400,000	779,446	—1,143,302
Denver & Salt Lake.....	255	547,649	88,665	636,314	217,249	355,868	3,931	1,039,842	159.96	—397,292	36,000	—433,330	—128,835
Detroit & Mackinac.....	381	317,536	112,523	430,059	75,634	147,244	17,069	263,837	124.75	—112,118	25,320	—137,439	—132,251
Detroit & Toledo, Shore Line.....	457	1,045,842	45,556	1,091,398	51,987	57,593	1,363	268,918	124.96	404,644	34,246	339,888	84,588
Detroit, Toledo & Ironmont.....	292	724,003	9,012	733,015	321,066	440,598	11,545	536,956	124.96	—213,370	34,432	—248,802	—38,870
Duluth & Iron Range.....	410	1,462,041	167,701	1,629,742	444,371	511,278	9,114	703,357	100.79	—13,681	92,525	—106,606	—94,620
Duluth, Missabe & Northern.....	599	901,980	321,960	1,223,940	222,955	270,055	23,606	745,257	101.49	—19,452	76,003	—95,489	—19,109
Duluth, South Shore & Atlantic.....	178	564,371	99,972	664,343	86,121	132,061	9,759	321,371	83.09	103,044	34,926	68,116	43,335
Duluth, Winnipeg & Pacific.....	3	1,045,842	45,556	1,091,398	51,987	57,593	1,363	268,918	124.96	—213,370	34,432	—248,802	—38,870
East St. L. Connecting.....	1,027	3,281,287	690,894	3,972,181	51,123	137,634	1,214	241,570	122.99	83,060	11,111	94,171	47,919
El Paso & S. W.....	824	6,170,262	25	6,170,287	509,076	784,740	38,767	1,138,987	62.16	1,581,814	235,991	1,345,450	—753,499
Elgin, Joliet & Eastern.....	1,987	20,059,018	3,928,476	23,987,494	610,438	1,725,569	26,734	2,736,342	71.56	2,067,046	211,397	1,855,649	—1,275,282
Erie.....	764	2,005,918	1,414,683	3,420,601	319,759	966,744	238,454	1,464,496	108.26	—2,192,008	973,197	—3,172,047	—790,833
Florida East Coast.....	88	102,152	1,247,537	1,349,689	625,812	692,109	34,032	1,804,960	86.26	522,129	144,206	377,923	—1,211,834
Fonda, Johnston & Gloversville.....	253	339,996	95,450	435,446	38,197	35,116	2,060	151,496	67.67	117,566	19,600	97,966	—15,680
Fort Smith & Western.....	454	2,282,093	858,742	3,140,835	367,474	664,897	18,552	1,260,415	91.57	39,461	20,000	19,461	—11,610
Fort Worth & Denver City.....	235	214,333	179,841	394,174	124,453	106,086	2,431	277,870	126.97	—113,939	12,520	—126,782	—173,241
Fort Worth & Rio Grande.....	1,382	4,495,883	1,738,954	6,234,837	1,028,472	1,439,522	73,609	2,649,590	111.33	1,113,337	208,822	905,355	—1,105,053
Galveston, Harrisburg & San Antonio.....	328	1,305,851	638,230	1,944,081	254,484	325,123	28,339	954,235	77.75	58,783	77,800	—19,017	—76,856
Georgia R. R.....	402	939,779	429,416	1,369,195	256,078	354,822	8,272	1,984,422	90.26	145,813	54,400	91,413	—78,081
Georgia Southern & Fla.....	348	242,026	72,821	314,847	108,154	70,368	4,232	198,422	121.77	—72,802	16,818	—90,347	—91,319
Georgia & Florida.....	569	1,523,569	523,575	2,047,144	396,559	546,008	40,084	1,208,171	102.15	41,070	102,651	—150,737	—244,717
Grand Rapids & Ind.....	1,002	4,895,828	974,890	5,870,718	779,514	1,297,181	50,214	3,255,982	87.20	81,800	200,602	61,376	1,197,793
Grand Trunk Western Lines.....	8,254	21,835,769	5,347,467	27,183,236	4,666,831	6,466,831	213,151	13,792,371	90.75	2,759,738	1,680,091	1,079,558	1,612,821
Great Northern.....	307	497,237	160,008	657,245	224,068	224,068	14,227	303,024	103.40	—24,540	39,895	—64,484	—238,036
Gulf & Ship Island.....	1,932	3,963,917	1,497,837	5,461,754	1,330,312	977,977	50,828	2,535,643	85.94	812,199	284,670	524,462	—1,068,228
Gulf, Colorado & Santa Fe.....	172	1,115,447	130,752	1,246,199	185,371	185,371	11,128	938,849	118.13	—2			

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF CALENDAR YEAR, 1919—CONTINUED

FOUR MONTHS OF CALENDAR YEAR, 1919—CONTINUED														
Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or decrease) last year.	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	(inc. misc.)	Way and structures.	Maintenance of equip- ment.	Traffic.								Trans- portation.
Kansas City, Mexico & Orient of Texas.	465	\$45,184	\$319,909	\$129,952	\$169,145	\$129,952	\$4,763	\$28,715	\$378,997	181.10	\$259,287	\$19,906	\$279,195	\$242,063
Kansas City Southern.	774	3,856,517	4,658,411	1,087,125	1,087,358	1,087,358	72,945	1,957,363	4,150,153	89.08	508,258	272,779	52,633	46,039
Kansas City Western.	25	2,580,094	232,470	2,397,754	410,657	50,302	72,945	1,957,368	382,085	99.64	10,998	105,500	95,478	398,466
Lake Erie & Western.	902	2,580,094	232,470	2,397,754	410,657	50,302	72,945	1,357,588	94,864	709.88	163,918	10,283	174,201	31,740
Lake Superior & Ishpeming.	34	22,056	1,099	26,877	65,390	76,457	794	38,133	190,795	709.88	163,918	10,283	174,201	31,740
Lehigh & Hudson River.	96	713,709	15,769	759,317	85,444	200,389	6,355	354,911	23,115	88.26	89,103	19,500	69,585	11,178
Lehigh & New England.	226	858,049	6,696	163,026	234,733	347,331	9,671	383,531	36,310	98.12	111,402	34,441	76,962	79,962
Lehigh Valley.	1,435	1,890,166	18,548,829	2,437,359	5,383,356	5,383,356	15,723	9,331,185	17,822,914	95.87	765,915	586,900	178,840	556,793
Long Island R. R.	398	1,684,317	4,183,210	6,560,639	1,055,946	1,055,946	42,672	3,073,489	185,600	93.45	430,040	360,464	67,587	443,366
Long Island R. R.	398	1,684,317	4,183,210	6,560,639	1,055,946	1,055,946	42,672	3,073,489	185,600	93.45	430,040	360,464	67,587	443,366
Los Angeles & Salt Lake.	1,168	3,935,532	1,317,821	5,544,089	959,901	1,222,032	63,762	1,808,022	117,802	75.77	1,343,288	262,286	1,080,547	356,447
Louisiana Ry. & Navigation.	349	939,750	144,278	1,135,917	299,604	210,543	15,276	645,325	30,127	105.72	64,957	56,000	121,072	346,406
Louisiana & Arkansas.	302	520,376	140,110	688,085	161,860	152,561	13,435	318,529	24,644	97.52	426,171	45,620	38,184	240,482
Louisiana Western.	207	741,496	438,835	1,229,232	148,562	231,997	15,634	355,023	43,789	65.33	37,865	1,001,052	3,406,118	2,62,042
Louisville & Nashville.	5013	23,745,706	8,080,330	33,606,503	5,491,990	8,211,637	426,135	13,908,565	752,092	86.87	4,410,786	1,001,052	3,406,118	2,62,042
Louisville Henderson & St. L.	199	651,697	228,564	914,397	126,401	126,401	28,319	366,582	29,355	83.43	151,497	16,000	135,156	59,267
Maine Central.	1,216	3,663,135	1,378,639	5,412,745	875,570	1,352,196	41,205	3,373,955	149,695	107.05	381,698	302,493	684,217	299,627
Maryland, Delaware & Va.	82	236,949	102,180	348,334	32,941	65,226	1,836	254,881	8,146	104.22	4,716	6,932	21,648	26,021
Michigan Central.	1,861	15,239,374	5,443,772	22,521,264	3,310,677	4,655,079	266,643	9,022,852	420,461	79.69	4,573,304	640,000	3,931,336	476,704
Midland Valley.	387	875,196	305,915	1,235,612	253,721	229,146	9,588	471,149	50,008	82.02	222,201	28,027	193,724	98,383
Mineral Range.	101	313,359	94,866	361,175	69,663	60,956	7,475	241,182	29,784	94.41	17,072	13,200	3,872	10,477
Minnesota & Int.	641	249,667	94,866	361,175	69,663	60,956	7,475	241,182	29,784	94.41	17,072	13,200	3,872	10,477
Missouri, Kansas & Texas R. R.	1,714	7,092,416	2,476,331	10,103,488	1,844,120	3,030,570	89,765	3,738,556	307,247	107.47	284,494	208,545	797,990	433,436
Missouri, Kansas & Texas R. R.	1,714	7,092,416	2,476,331	10,103,488	1,844,120	3,030,570	89,765	3,738,556	307,247	107.47	284,494	208,545	797,990	433,436
Missouri, Oklahoma & Gulf.	332	305,819	6,187,240	27,471,548	5,737,865	6,751,919	315,327	12,382,744	804,264	95.04	1,363,808	1,065,572	289,129	539,778
Missouri Pacific.	7,108	19,388,842	6,187,240	27,471,548	5,737,865	6,751,919	315,327	12,382,744	804,264	95.04	1,363,808	1,065,572	289,129	539,778
Missouri, Kansas & Texas Ry. of Texas.	1,796	4,383,908	2,321,128	7,257,425	1,488,628	1,406,551	68,849	3,910,978	286,665	131.36	100,899	194,897	162,174	381,575
Montclair R. R.	54	294,141	6,756	321,653	87,045	202,764	4,997	101,182	25,133	108.00	370,420	212,673	592,566	834,869
Montour R. R.	995	3,756,037	714,900	4,735,675	828,215	1,742,729	92,862	2,291,702	153,685	108.00	370,420	212,673	592,566	834,869
Mobile & Ohio.	108	923,252	79,796	1,023,397	255,751	139,491	1,691	352,426	25,614	75.92	246,424	20,000	226,404	150,226
Monongahela Ry.	6	1,512,085	681,068	2,328,904	353,264	534,684	30,604	1,094,443	80,497	111.72	77,498	9,577	87,075	160,226
Monongahela Connecting.	400	1,512,085	681,068	2,328,904	353,264	534,684	30,604	1,094,443	80,497	111.72	77,498	9,577	87,075	160,226
Nashville, Chattanooga & St. L.	1,247	3,848,963	1,723,181	6,016,176	1,264,727	1,624,604	128,320	2,795,762	178,624	100.38	22,469	200,000	223,044	1,351,954
Nevada Northern.	168	468,995	43,699	535,235	66,928	91,847	3,998	161,553	17,960	98.00	192,400	73,292	119,107	248,530
New Orleans & N. E.	398	1,332,767	432,780	1,995,532	289,080	515,923	31,743	1,041,684	55,224	92.00	39,825	113,428	73,809	560,486
New Orleans Great Northern.	284	525,400	157,766	683,166	155,432	160,713	9,418	195,369	31,418	92.00	57,345	41,330	15,676	140,229
New Orleans, Texas & Mex.	191	387,546	123,653	558,753	141,907	148,885	9,418	195,369	31,418	92.00	57,345	41,330	15,676	140,229
New York Central.	6,075	56,831,161	24,249,439	91,467,179	12,263,412	20,597,980	806,072	42,616,976	243,338	87.66	11,282,766	4,325,206	6,953,737	1,227,959
New York, Chicago & St. L.	573	7,210,575	652,554	8,067,650	990,511	1,530,941	102,072	3,196,820	209,209	95.07	2,034,832	220,000	1,814,467	1,313,308
New York, N. H. & Hart.	1,965	13,309,646	3,284,056	30,662,654	4,021,895	6,998,810	160,345	16,367,127	1,074,366	74.80	945,021	1,072,000	134,188	281,115
New York, Ont. & Western.	569	1,797,784	411,716	2,712,267	426,757	887,988	33,152	1,465,659	95,980	107.26	196,947	98,800	295,714	517,375
New York, Phila. & Norfolk.	121	1,782,504	491,576	2,453,860	213,596	505,758	6,940	1,158,659	45,056	99.67	426,392	68,720	357,671	284,505
New York, Susq. & Western.	135	809,002	209,264	1,189,621	131,585	198,646	6,940	1,158,659	45,056	99.67	426,392	68,720	357,671	284,505
Newburgh & South Shore.	7	1,354,879	519,252	2,018,237	443,495	108,856	29,131	1,008,347	81,016	81.23	103,877	30,862	73,016	124,417
Norfolk Southern.	2,087	19,469,923	3,316,040	23,966,345	3,181,411	7,031,358	136,950	8,897,201	403,267	82.33	4,234,428	1,040,000	3,193,831	361,128
Norfolk & Western.	112	343,469	50,711	405,880	104,050	25,486	1,200	265,882	7,112	100.40	407,523	13,600	15,242	722,285
Northern Alabama.	6,565	22,255,901	5,692,605	29,949,640	4,620,726	5,486,257	246,983	11,681,225	752,596	77.05	6,782,035	2,200,535	4,666,796	766,738
Northern Pacific.	507	834,327	585,295	1,583,350	409,286	265,958	19,111	800,641	49,700	98.01	31,354	88,248	57,208	369,678
Northwestern Pacific.	2,347	8,324,156	2,002,144	11,077,218	2,375,665	1,911,345	60,679	3,523,932	345,849	76.11	2,645,909	711,555	1,933,507	1,043,941
Oregon Short Line.	2,069	5,569,160	1,978,623	8,307,165	1,745,575	1,387,493	106,411	3,465,264	373,202	86.82	1,094,107	456,290	636,980	502,747
Oregon, Wash. R. R. & Nav.	772	1,161,146	310,591	1,555,635	489,064	579,929	15,069	909,108	62,068	131.57	491,171	63,555	555,577	1,012,458
Panhandle & Santa Fe.	1,754	20,627,090	6,103,727	29,497,422	4,239,240	8,740,959	277,134	14,395,055	735,335	96.88	920,273	1,173,257	254,175	1,416,174
Pennsylvania R. R.	5,360	72,020,478	30,228,640	112,453,769	15,136,303	31,371,349	987,038	53,913,516	2,929,094	94.64	6,023,537	3,494,692	2,525,336	3,470,643
Pennsylvania R. R. East.	41	285,654	26,79,											

Atlantic Crossed in 16 Hours, 12 Minutes

The flight across the Atlantic, by way of the Azores by the United States Navy biplane in command of Lieut. Commander A. C. Read on May 26 and 27, was followed on June 14 and 15 by a flight from St. John's, Newfoundland, to Clifden, Ireland, 1,960 miles, in 16 hours, 12 minutes, without a stop. This flight was made by Captain John Alcock, and Lieutenant Arthur W. Brown of the British Royal Air Force, flying in a Vickers-Vimy biplane. They left the Newfoundland coast about noon on Saturday, and arrived at Clifden, near Galway, at 8:40 a. m., Greenwich time, on Sunday. This flight wins a prize of \$50,000 offered by the London Daily Mail several years ago.

Safety First in Southwestern Region

The campaign to reduce accidents to employees in the Southwestern region during the month of May, 1919, reduced the number of these accidents 56 per cent from the records for the same month last year. During the month of the campaign there was a total of 646 accidents to employees as compared with 1,475 during the corresponding period last year. During the three months' period January to March, 1919, inclusive, an average of one employee per month was killed to every 9,715 in service, while during the month of May the number was reduced to one employee killed to every 24,983 in service. During the same three months' period one employee out of every 153 was injured, while during the month of May one employee was injured to every 273 in service.

To Eliminate the Noise Nuisance

Among the rules prescribed by American railroads for the guidance of enginemen, and other trainmen, in performing their work with the least practicable offense to adjacent residents, that of the Pittsburgh division of the Pennsylvania Railroad is one of the most comprehensive. It is embraced in Sections 464 and 468 of the working time-table and is reprinted below. The italics are the editor's; a brief comment on the rule will be found in the editorial columns.

PENNSYLVANIA RAILROAD, PITTSBURGH DIVISION

"464. Enginemen will use the whistle *judiciously*, where required by rule or law, but all *unnecessary* long and loud blasts must be eliminated in order to minimize the annoyance to and complaints from the residents along our right-of-way.

"When handling trains in or about borough limits, except in approaching grade crossings, the bell must be rung when proper to have it serve the purpose instead of using the whistle.

"Boroughs have very generally passed ordinances prohibiting all unnecessary noises and smoke, a violation of which involves a fine and imprisonment of person at fault.

"468. In order to avoid complaint of *what may be considered* unnecessary noise in connection with the movement of trains and shifting of cars, it is desired that *all employees* give this matter special attention. The engine whistle must not be used except as provided by rule or special instruction, or when necessary to prevent an accident, and when so used it *must not be sounded any louder than actually necessary*. Engines should not be permitted to blow off steam except when testing safety valves. When shifting cars at stations and elsewhere, care must be exercised to eliminate all unnecessary and avoidable noise."

New York Electrical Society

Edwin B. Katte, chief engineer of electric traction of the New York Central, has been elected president of the New York Electrical Society. Mr. Katte is a graduate of Sibley College, Cornell University, with the degree of M.E. in 1893, and with the degree of M.M.E. in 1894. He began railroad work on the New York Central & Hudson River in 1896. In 1903 he was appointed electrical engineer, which carries with it the secretaryship of the electric traction commission. In 1906 he was appointed chief engineer of electric traction of the New York Central & Hudson River. He is a past vice-president of the American Society of Mechanical Engineers.

Traffic News

Edward L. Hamilton has been appointed general agent for the American Railway Express Company at Chicago to succeed William Gourlay, who has been appointed manager of the London, Eng., branch of the American Express Company.

Representatives of the railroads and electric lines centering in Toledo, Ohio, expect to transport 60,000 or 75,000 persons on the occasion of the Willard-Dempsey fight at Toledo on July 4. Parking space for approximately 600 sleeping cars has been provided.

Traffic through the canals at Sault Ste. Marie, Michigan and Ontario for the month of May, 1919, shows a substantial decrease eastbound; a total of 7,895,542 tons of freight as compared with 9,200,843 tons in May of last year. The total tonnage westbound was 2,670,784 tons; last year it was 2,203,202 tons.

The record of overseas traffic for the week ended June 11, showed 10,146,408 bushels of grain in the elevators at North Atlantic Ports, the excess for the week of deliveries over receipts being 1,459,809 bushels. South Atlantic and Gulf Ports report on June 7, 4,788,751 bushels of grain in elevators distributed as follows: New Orleans, 2,511,880 bushels; Galveston, 2,276,871 bushels; Port Arthur, empty; Texas City, empty.

A comparison of freight car loadings on the lines of the Northwestern region for the month of May, 1919, with the corresponding period last year shows a decrease of 53,962 cars, 640,698 cars being loaded during 1919 as compared with 694,660 in 1918. A comparison of grain loading for the same period shows an increase in 1919 of 12,755 cars, while bituminous coal loaded at mines during the same period show a decrease of 13,078 cars.

R. D. Williams has been appointed traffic manager of the California Fruit Exchange, Sacramento, Cal., to succeed Henry Cole, who becomes traffic manager of the California Fruit Growers' Exchange at Los Angeles, Cal. Mr. Williams was formerly connected with the traffic department of the Erie railroad at San Francisco, Cal. In April, 1918, he organized the traffic department for the housing division of the Shipping Board, completing that work in May of this year.

The agricultural departments of the railroads of the South-eastern States are praised warmly by J. J. Brown, Commissioner of Agriculture of Georgia, in his annual report. Their extension work is carried on by "some of the ablest and best informed men of Georgia," who give their entire time to the furtherance of agriculture. These men, being thoroughly conversant with up-to-date agricultural methods and the most modern means of marketing and transportation, are rendering valuable service. The commissioner also commends the hearty co-operation of the railroads with his department in moving promptly all shipments of products directed through the State's market bureau division.

Howard H. Hays, manager of the Bureau of Service National Parks and Monuments, a sub-committee working under the direction of the Western Passenger Traffic Committee for the advertisement of America's national parks and monuments, has bought the Yellowstone Park Camping Company and assumed the position of general manager of that company with office at Livingston, Mont. Mr. Hays was formerly manager with the Union Pacific-Chicago & North Western department of tours and was the organizer as well as the manager of the Bureau of Service National Parks and Monuments. Prior to his connection with the railroads he was general tourist agent of the "Wylie Way," the pioneer Yellowstone Park camping company.

Equipment and Supplies

Locomotive Deliveries, Week Ended May 31

Locomotives were shipped to railroads under federal control during the week ended May 31 as follows:

Works	Road	Number	Type
American	A. C. L.	2	USRA Pacific
	P. L. W.	3	USRA Santa Fe
	C. C. C. & St. L.	3	USRA 8-w. Sw.
		8	
Baldwin	A. T. & S. F.	2	Pacific
	I. H. B.	6	USRA 8-w. Sw.
	Southern	3	USRA Mount.
	B. & O.	4	USRA 6-w. Sw.
	S. P.	6	Santa Fe
	A. T. & S. F.	1	Mountain
	C. B. & Q.	2	Santa Fe
	C. B. & Q.	1	Mikado
	U. P.	1	Santa Fe
	N. & W.	1	Mallet
	G. N.	2	8-w. Sw.
	T. & P.	1	Santa Fe
	T. & P.	2	Pacific
	P. & R.	1	Mallet
		33	
Total		41	

Locomotive Deliveries Week Ended June 6

The following locomotives were shipped to roads under Federal control during the week ended June 6:

Works	Road	Number	Type
American	N. & W.	20	USRA Mallet
	P. L. W.	2	USRA 6-w. Sw.
	Wash. Ter.	3	USRA 6-w. Sw.
		25	
Baldwin	C. C. & O.	1	Mallet
	Sou. Pac.	5	Santa Fe
	T. & P.	3	Santa Fe
	C. B. & Q.	1	Santa Fe
	U. P.	1	Santa Fe
	I. H. B.	6	USRA 8-w. Sw.
	N. & W.	1	Mallet
Southern		1	USRA Mount.
		19	
Total		44	

Freight Cars

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for 100 second-hand all steel tank cars, 8,000-gal. capacity, without heater coils; also 100 of 10,000-gal. capacity.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, is in the market for several second-hand steel self-clearing hopper bottom coal cars; one 40-ft. box car with automobile end doors, and one gondola car with drop ends.

THE CANADIAN NATIONAL, Toronto, Ont., has sent inquiries to Canadian car builders for the construction of 20 steel postal cars and 20 steel first-class coaches. The postal cars are to comply with the latest Canadian Railway Mail Service department specifications and also those of the United States Railway Mail Service and will be 73 ft. 6 in. in length. George E. Smart, general master car builder, is receiving the bids.

Iron and Steel

THE BELGIAN GOVERNMENT has ordered 8,000 tons of rails from the Algoma Steel Corporation.

THE CANADIAN GOVERNMENT has ordered 10,000 tons of rails from the Algoma Steel Corporation.

Signaling

THE NEW YORK CENTRAL has ordered from the Federal Signal Company, Albany, N. Y., a 68-lever style "A" mechanical interlocking for Port Byron, N. Y.

Supply Trade News

The Judson Freight Forwarding Company, Chicago, Ill., will open its new office, 202 Wells Fargo building, 204 Camp street, New Orleans, La., with O. E. Duggan, general agent, in charge.

The Niles-Bement-Pond Company, Pittsburgh, Pa., has removed its office from the Frick building to 425 Seventh avenue. This company will keep a stock of Pratt & Whitney small tools at the new office and store.

Major John L. Wood, formerly connected with the Buckeye Steel Castings Company, Chicago, and interested in several railway supply companies including Edwin S. Woods & Co., Chicago, died on June 13, at Pasadena, California, after a protracted illness.

The Railway Audit & Inspection Company of Philadelphia, Pa., has opened an office in Boston, Mass., for the purpose of having representation in the New England territory. H. G. Hathaway has been appointed office manager and C. J. Logan will continue a special representative in this territory as heretofore.

Edwin T. Jackman, formerly of E. S. Jackman & Co., Chicago, has returned from Sheffield, England, where he has been investigating methods in connection with tool and alloy steels. On July 1 he will become manager of the Boston, Mass., office of the Firth-Sterling Steel Company, McKeesport, Pa.

The Betson Plastic Fire Brick Company has been incorporated under the name of the Betson Plastic Fire Brick Company, Inc., with headquarters at Rome, N. Y. Frank J. Jewell is president and secretary, and Nelson Adams, vice-president and treasurer. The company manufactures plastic fire brick for boiler furnace linings and baffle walls and "Hi-Heat" cement for use in boiler rooms.

A company, known as the Cummins-Blair Company, a subsidiary organization which will be affiliated with the C. R. Cummins Company has recently been formed. This company will specialize in reinforced concrete and brick building construction and reinforced concrete bridges and arch culverts. N. F. Blair is president, C. R. Cummins, vice-president and W. A. Beaumont, treasurer. The headquarters will be at Cleveland, Ohio.

Colonel R. T. Lamont, president of the American Steel Foundries, Chicago, has been awarded the distinguished service medal for "exceptionally meritorious service as assistant to the chief of the procurement division, later as chief of the procurement division and as a member of the claims board of the ordnance department," and for "rendering material assistance to the nation's industry in adjusting equitably outstanding contracts in full justice to employers and employees alike."

The Central Steel Company, Massillon, Ohio, has opened new offices in Detroit, in the Book Building, 35-37 Washington boulevard, rooms 948-9-50. Arthur Schaeffer, former assistant director of sales at the home office, Massillon, has been appointed district manager of sales, with Frank Gibbons as his assistant. Mr. Gibbons, who has just joined the organization, has been associated with the Carbon Steel Company for five or six years. He spent a great part of this time in the Carbon Company's Pittsburgh plant, and for the last several months he has been district sales manager of its Detroit office.

The Carter Bloxonend Flooring Company, Kansas City, Mo., has been formed to take over the manufacturing and selling interests in Bloxonend Flooring formerly held by the C. J. Carter Lumber Company, Kansas City, Mo., the Doniphan Lumber Company, Kensett, Ark., and the Marsh & Truman Lumber Company, Chicago, Ill. The Kansas City

office will be under the direction of **C. J. Carter**, president, and **Mabry Mellier**, vice-president, will have charge of sales. The sales office in the McCormick Bldg., Chicago, will be in charge of **M. G. Truman** as vice-president, who will also have charge of the railroad sales to those roads with principal operating offices east of the Mississippi river. The Builders' Material Supply Company, New York, will continue as sales agents for the new company in the New York district for all other than railroad business. The manufacturing plant of the company will be located at Kensett, Ark.

J. M. Woodruff, manager of the advertising and paving departments of the Standard Asphalt & Refining Company, Chicago, a subsidiary of the Cities Service Company, New York, has resigned to become general manager of the **Southern Asphalt Association**, with headquarters at Atlanta, Ga. In this capacity he will have charge of the publicity of this association which was organized for the purpose of supplying information to public officers and taxpayers concerning the advantages of asphalt for paving roads and streets. From 1909 to 1913, Mr. Woodruff was manager of the paving department and in charge of advertising for the Standard Asphalt & Rubber Company, and the following four years he was southern representative of the Warren Brothers Company, Boston, Mass., bitulithic paving contractors, with headquarters at Richmond, Va.

The **S. F. Bowser Company, Ltd.**, Toronto, Ont., which has for a number of years been manufacturing and selling Bowser gasoline and oil pumps, tanks and storage systems under the control of the parent company, S. F. Bowser & Co., Inc., Fort Wayne, Ind., has been re-organized under the Canadian laws to operate as a strictly Canadian firm. **H. C. Christie**, who has been for some time past connected with the Canadian factory of the S. F. Bowser Company, recently as sales manager, has been elected manager, with **E. E. Cummings** as factory manager. For a number of years, nearly the entire Canadian trade of the S. F. Bowser Company has been supplied from the Toronto factory, but this company has been under the direction of the home office at Fort Wayne. Through the present re-organization, the Canadian factory is to be operated and controlled as a separate institution. The officers are **S. F. Bowser**, president; **S. V. Bechtel**, vice-president; **H. J. Grosvenor**, secretary, and **W. G. Zahrt**, treasurer.

Railway & Industrial Engineers, Inc.

The **Railway & Industrial Engineers, Incorporated**, with offices at 25 Broad street, New York, recently organized by **J. E. Muhlfeld** and **V. Z. Caracristi**, as announced in the *Railway Age* of May 23, page 1288, announces that it has associated with it an experienced, competent and reliable staff of experts thoroughly familiar with domestic and foreign methods and practices, and offers to bankers, corporations and others its services in a representative, advisory, consulting or administrative capacity as follows:

Organization, management and operation of railroad, public utility, industrial and manufacturing enterprises.

Examination of proposed capital and consequential expenditures for facilities or equipment to ascertain whether they are justified and will improve conditions, increase revenues or reduce costs of operation and maintenance.

Assistance in connection with plans for financing projected improvements and extensions.

Review or preparation of plans, specifications and estimates of costs of contemplated new construction work, or enlargements of existing facilities.

Rehabilitation and modernization of unprofitable undertakings, including, if desired, their temporary management and operation until satisfactory results are obtained.

Advisory or consulting engineers to insure that expenditures are made in a manner that will produce maximum economic results and reflect the greatest return to the properties, and provide the best security to the owners.

Advisors and conferees in labor problems and in the preparation of rules and regulations governing compensation and working conditions.

Preparing, passing upon or approving inventories, valuations and appraisals of properties and equipment.

Consulting engineers for exporters and importers and their foreign representatives, to co-ordinate specifications, prices and purchases for the best interest of each.

Reporting on inventions, new methods and processes, and assistance in the development of those having practical merit and commercial value.

J. E. Muhlfeld, who has been in transportation work for about 25 years, has, during the past ten years, been engaged in the habilitation of roadway, terminals, shops and equipment on various railways, and more particularly in the design and development of the Mallet and other types of large steam locomotives in combination with the utilization of low-grade fuels for the purpose of increasing the average train load and reducing the costs of operation and maintenance on railroads in the United States, Canada and Brazil. He was born at Peru, Ind., on September 18, 1872, and studied mechanical engineering at Purdue University; he served as machinist, and then as locomotive fireman and engineer on the Wabash Railroad and later successively as enginehouse foreman and general foreman on the same road; master mechanic at Port Huron and Montreal, on the Grand Trunk; superintendent of machinery and rolling stock on the Canadian Government Railways; superintendent of motive power on the Baltimore & Ohio, and vice-president and general manager of the Kansas City Southern. During the past five years he has been located in New York and has specialized in railway and other valuation and improvement work and in the development of methods and appliances for the modernization of locomotives and central power stations for the purpose of reducing investment and fuel costs, utilizing waste heat, eliminating arduous labor, and increasing capacity.

V. Z. Caracristi has been engaged in railway and industrial work for the past 20 years, having specialized in locomotive, car and shop design and construction. He served as shop engineer and maintenance supervisor for the Richmond plant of the American Locomotive Company, and in the inauguration and installation of a uniform system of maintenance and shop betterment he was general maintenance supervisor for all of the plants of the same company. He associated on the design and construction of the Washington, D. C., terminal and station, and later served as assistant to general superintendent of motive power of the Baltimore & Ohio, in charge of shop additions, construction and equipment, and general betterment of the design and construction of locomotives and cars, which included the design and construction of the first Mallet type locomotive. He was then engaged in carrying out improvements of the Brewster shops of the Wheeling & Lake Erie, and the Watervliet shops, and Carbondale mechanical terminal of the



J. E. Muhlfeld



V. Z. Caracristi

Delaware & Hudson Company; in charge of the layout, design and equipment of extensions to the Lima Locomotive Works, and various additions to plants and power houses of the American Locomotive Company. For the past six years he has been engaged in consulting work for various bankers on financial reports and suggesting improvements in industrial operating methods for controlled corporations. During this time he was engaged in development and commercial work on means and methods of burning coal in suspension, which work he will continue.

American Brake Shoe & Foundry Changes

William G. Pearce has retired as president of the American Brake Shoe & Foundry Company to become chairman of the executive committee, and Joseph B. Terbell, vice-president, has been elected



W. G. Pearce

was born at Marietta, Ohio, on June 11, 1859. He entered railway service in August, 1877, as a clerk in the office of the controller of the Missouri, Kansas & Texas, at Sedalia, Mo. He was later promoted to bookkeeper and chief clerk in the same office, and in August, 1879, left that road to take a clerical position in the auditing department of the Northern

Pacific. He was successively promoted to assistant express auditor, assistant auditor of disbursements and auditor of disbursements in the same department, and in February, 1890, was appointed general purchasing agent. From May, 1892, to September, 1896, he was assistant general manager of the same road, and when the Northern Pacific was re-organized on the latter date, he was transferred to Tacoma, Wash., as assistant general superintendent. From August, 1900, to July 1, 1901, he



J. B. Terbell

was assistant to the president of the Northern Pacific, the Seattle & International, and the Washington & Columbia River, at the same time being general manager of the Seattle & International. From July, 1901, to March, 1902, he was general manager of the Northern Pacific, leaving railway service at the end of that time to become second vice-president of the Griffin Wheel Company. On June 5, 1905, he was also made general manager of this company, with headquarters at Chicago. He left the Griffin Wheel Company on November 22, 1910, to become vice-president of the Ameri-

can Brake Shoe & Foundry Company, and in May, 1916, was elected president, with headquarters at New York.

J. B. Terbell, the new president, was born at Corning, N. Y., in February, 1863, and was educated at Hamilton College, graduating in the class of 1884 with the degree of A. B. After leaving college he served with the Fall Brook Railway, now the Pennsylvania division of the New York Central, with headquarters at Corning, N. Y., and later was vice-president of the Corning Iron Works. In 1897, he became president of the Corning Brake Shoe Company, and in 1902, was elected vice-president of the American Brake Shoe & Foundry Company, with headquarters at Chicago, in charge of the company's western business. In 1915, Mr. Terbell came to the New York office in connection with munition contracts for the British Government, and on July 1, succeeds Mr. Pearce as president.

Trade Publications

SPECIFICATIONS FOR MANGANESE CROSSINGS.—The Balkwill Manganese Crossing Company, Cleveland, Ohio, has just issued specifications for its articulated cast manganese crossings accompanied by standard detailed drawings for crossings at various angles, for heavy and medium duty and for three-hole and two-hole drilling.

CEMENT GUN WORK.—The Cement Gun Construction Company, Chicago, has issued Gunnite Book No. 6, containing 24 pages illustrative of the structures which have been treated with the Cement Gun process for the application of a coating of gunite to produce wall, roof and floor surfaces or to protect structural steel against corrosion.

EYE SHIELDS.—The Chicago Eye Shield Company, Chicago, has issued a new catalogue describing various types of goggles, respirators and protective shields for chippers and foundry workers. Interesting data are included on the spectrum of the welding arc and the absorption of ultra-violet rays by the special Essentialite lenses which this company uses in welders' goggles.

Financial and Construction

Railway Financial News

ARTESIAN BELT.—This road was sold at auction on June 3 for \$150,000 to Harry Landa, J. E. Jarrett and W. R. Wiseman, officers of the Commonwealth Bank and Trust Company of San Antonio, and their associates, who were the only bidders for the property. The Artesian Belt has a length of line of 46 miles and has been in the hands of receivers since April 25, 1917.

Railway Construction

PENNSYLVANIA LINES WEST OF PITTSBURGH.—This road will build a group of repair shops at Stark, Ohio, consisting of a locomotive erecting shop, heavy and light machine shops, tank shop, flue shop, wheel and pipe shop, blacksmith shop, firing-up shed, storehouse, office building, rest house and shed for the storage of miscellaneous material. A portion of these buildings are already under contract, and bids have been requested or will be requested in the near future on the remainder. The buildings, with the exception of the rest house, office building and storehouse, which are of brick and timber construction, and the firing-up shed, which is of reinforced concrete construction, will be of steel frame and brick exterior wall construction and carried on concrete foundations.

ANNUAL REPORTS

The New York Central Railroad Company—Annual Report

To the Stockholders of

THE NEW YORK CENTRAL RAILROAD COMPANY

The Board of Directors herewith submits its report for the year ended December 31, 1918, with statements showing the income account for the year and the financial condition of the company.

The operation and maintenance of the company's road were conducted under Federal control during the year 1918. The mileage covered is as follows:

	Miles
Main line and branches owned.....	3,699.14
Leased lines	1,920.40
Lines operated under trackage rights.....	456.25
Total road operated.....	6,075.79

The construction of a joint terminal of the Putnam Branch at Sedgwick Avenue, New York, in accordance with an agreement with the Interborough Rapid Transit Company, whereby the Putnam bridge over the Harlem River was surrendered for use in connection with the extension of the elevated system up Jerome Avenue, decreased the length of the Putnam Division by 23/100ths of a mile.

The Cardiff Branch, Reddick to Cardiff, Illinois, 3.49 miles, was abandoned.

To correct an error in the 1917 report, 11/100ths of a mile has been added to the main line mileage in the State of Illinois.

These changes produce a net decrease in operated mileage of 3.61 miles.

There was no change in the capital stock of the company during the year.

Since the date of the annual meeting on January 23, 1918, the number of stockholders has grown 1,591, the total number at the end of the year being 28,693, of whom 28,395 are in the United States, and 298 abroad. The par value held by those here is \$247,543.855, and by those abroad \$2,053,500, the average holdings being 87 and 69 shares respectively. In 1915 the numbers reported were 22,270 here, and 2,772 abroad, the general average holding being, approximately, 100 shares, while now it is 87 shares.

The changes in the funded debt of the company are shown in the following statement:

Amount as reported on December 31, 1917, was..... \$711,883,086.19

Included therein were the following securities which had been reacquired or held pending their sale, and (with the exception of certain of them with a par value of \$730,000) had been pledged for the company's notes:

N. Y. C. & H. R. R. Co. refunding and improvement mortgage 4½% bonds.....	\$20,000,000.00
N. Y. C. R. R. Equipment Trust certificates of 1917.....	1,218,000.00
N. Y. C. & H. R. R. Co.—Lake Shore collateral gold bonds.....	10,000.00
R. W. & O. R. R. Co. 1st consolidation bonds	2,000.00
	21,230,000.00

leaving the total funded debt actually outstanding at the beginning of 1918..... \$690,653,086.19

Retired during the year:

R. W. & O. Terminal 1st mortgage 5% bonds matured and paid..... \$375,000.00

Payments falling due during the year on the company's liability for certificates issued under equipment trust agreement as follows:

N. Y. C. Lines Trust of 1907, installment due November, 1918.....	1,492,884.74
Boston & Albany Trust of 1912, installment due October, 1918.....	500,000.00

a total decrease of..... 2,367,884.74

leaving the funded debt actually outstanding December 31, 1918..... \$688,285,201.45

New York Central Railroad Equipment Trust certificates of 1917 to an aggregate amount of \$6,648,000 were issued during 1918, but as all of them were concurrently acquired by the company, there is no change in the funded debt in this connection.

As was pointed out in the last annual report, the President of the United States took possession and assumed control of the railroad property of our company on December 28, 1917. By the terms of the President's proclamation the possession, control, operation, and utilization of the transportation systems were vested in a Director General; and it was stated that, until the Director General should otherwise determine, his powers would be exercised through the boards of directors, officers, and employees of the systems taken over. The Director General appointed Regional Directors under whom the railroads of the several districts were unified as to control and operation. Subsequently, Federal Managers and other federal officers were appointed and required to report through the Federal Managers to the Regional Directors and the Director General.

As of December 27, 1918, the company, jointly with The Toledo and Ohio Central Railway Company, The Zanesville and Western Railway Company, The Kanawha and Michigan Railway Company and the Kanawha and West Virginia Railroad Company, executed an agreement with the Director General of Railroads providing for the operation, during Federal control, of the roads of the parties to the agreement by the Director General of Railroads for an annual total standard compensation of \$58,122,084.92, divided as follows:

The New York Central Railroad Company.....	\$55,802,630.50
The Toledo and Ohio Central Railway Company....	1,086,650.87
The Zanesville and Western Railway Company (deficit)	107,598.45
The Kanawha and Michigan Railway Company.....	1,295,141.37
Kanawha and West Virginia Railroad Company....	45,260.63
	\$58,122,084.92

Under the agreement, all salaries and expenditures incurred by the company, during federal control, for purposes which relate to the existence and maintenance of the corporation, are required to be borne by the corporation, out of its compensation and other income.

Immediately upon his taking office, the Director General of Railroads appointed as Regional Director in charge of the Eastern District Mr. A. H. Smith, then President of The New York Central Railroad Company. This district, at that time included practically all the railroad lines north of the

Ohio and Potomac rivers and east of the Indiana-Illinois state line. Mr. Smith assumed the duties of the Regional Director's office, which involved dealing with a complicated traffic situation and the co-ordinating of the lines for war purposes, as an addition to his obligations as President of the company.

Early in 1918, the Director General decided that officers in charge of Federal operation should not continue their positions with the corporation, except in special cases and where permission was given. Thereupon, Mr. Smith resigned his office as President, effective May 31st, and Mr. William K. Vanderbilt, Jr., was elected in his stead. Later in the year the following general executive officers also resigned in order that they might continue in the service of the United States Railroad Administration:

Mr. A. T. Hardin, Vice-President; Mr. C. F. Daly, Vice-President; Mr. P. E. Crowley, Vice-President, and Mr. H. M. Biscoe, Vice-President.

A separate corporate organization has been formed to conduct the affairs of the company under instructions from the President and the Board of Directors, and to take all appropriate and necessary corporate action to carry out the obligations assumed by it under the agreement. Through this organization, the personnel of which is shown on the first page of this report, expenditures for additions and betterments to the property, and for the maintenance of road and equipment under federal management, are investigated and verified and supervision is exercised for the protection of the company's interests, both as to the property transferred under the Federal Control Act, and that remaining with the corporation.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME

Year ended
December 31, 1918

COMPENSATION ACCRUED FOR THE POSSESSION, USE AND CONTROL OF THE PROPERTY OF THIS COMPANY AND ITS LEASED LINES.. \$55,802,630.50

MISCELLANEOUS OPERATIONS	
Revenues	\$1,963.59
Expenses	4,925.78

NET DEFICIT 2,962.19

OTHER CORPORATE INCOME

Income from lease of road.....	\$106,424.88
Miscellaneous rent income.....	904,841.70
Miscellaneous non-operating physical property	632,283.40
Separately operated properties—profit.....	1,147,244.01
Dividend income	6,379,728.57
From funded securities.....	500,845.06
From unfunded securities and accounts.....	3,745,610.50
Miscellaneous income	54,274.23

TOTAL OTHER CORPORATE INCOME..... 13,471,252.35

GROSS INCOME \$69,270,920.66

DEDUCTIONS FROM GROSS INCOME

Miscellaneous rents	\$689,074.60
Miscellaneous tax accruals.....	300,045.83
Rent for leased roads.....	9,314,910.15
Interest on funded debt.....	29,432,623.35
Interest on unfunded debt.....	2,004,364.10
Amortization of discount on funded debt...	556,975.56
Miscellaneous income charges.....	138,783.96
Separately operated properties—loss.....	62,628.25
War taxes	2,017,501.92
Corporate general expenses.....	288,667.84

DEDUCTIONS FROM GROSS INCOME..... 44,805,575.56

Less revenues and expenses applicable to the period prior to January 1, 1918, settled for account of the corporation by the United States Railroad Administration.....

6,548,223.55

NET CORPORATE INCOME..... \$17,917,121.55

DISPOSITION OF NET INCOME

Dividends declared—5 per cent.....	\$12,479,610.00
To sinking funds.....	115,563.46

TOTAL APPROPRIATIONS 12,595,173.46

SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS.. \$5,321,948.09

Profit and Loss Account

BALANCE TO CREDIT OF PROFIT AND LOSS DECEMBER 31, 1917.. \$75,245,201.74

ADDITIONS:

Surplus for the year 1918.....	\$5,321,948.09
Sundry deferred credits and adjustments...	802,435.98
Profit on road and equipment sold.....	27,766.74

6,152,150.81

\$81,397,352.55

DEDUCTIONS:

Loss on retired road and equipment.....	\$31,054.16
Loss on sale of capital stock of the Pennsylvania Coal and Coke Company.....	281,250.00
Charging off various uncollectible accounts...	29,850.40
Readjustment of operating results of the Detroit Terminal Railroad prior to November 1, 1912.....	42,645.66
Sundry deferred debits and adjustments....	69,254.43

454,054.65

BALANCE TO CREDIT OF PROFIT AND LOSS DECEMBER 31, 1918..... \$80,943,297.90

The amount of standard compensation, \$55,802,630.50, accrued under federal control for the possession and use of the company's property, and its leased and operated lines, was based upon the average annual railway operating income for the three years ended June 30, 1917.

As required by the Federal Control Act, this amount was certified by the Interstate Commerce Commission as agreeing with the income reported to it, subject, however, to such changes and corrections as the Commission might hereafter determine and certify to be requisite.

There were delivered in 1918, 1 electric locomotive, 139 steam locomotives, 20 steel baggage and mail cars, 71 steel passenger coaches, 2 steel dining cars, and 105 steel baggage cars, which were provided for under the New

York Central Railroad Equipment Trust of 1917 as authorized by the Board of Directors on October 19, 1916. On account of the prevailing unsatisfactory market conditions for the sale of the equipment trust certificates, and in order to procure the equipment as needed, the company has purchased at par and accrued interest \$6,648,000 of the certificates, of which \$4,187,000 were pledged as security for short-term loans and \$2,461,000 carried in the treasury of the company.

The Director General of Railroads allotted to the company 4,500 freight cars, estimated to cost \$13,201,000, and 120 locomotives, estimated to cost \$6,192,955; a total of approximately \$19,393,955. Of this equipment, 2,556 freight cars and 114 locomotives were delivered during the year.

The Director General also allotted to the company, as Lessee of the Boston and Albany Railroad, 10 locomotives, estimated to cost \$622,770, for use on that road.

These allotments were accepted by the company and the equipment is being constructed under contracts between the Director General and the builders, and the financing of the cost thereof is being arranged between the Director General and the company.

The changes in the property investment account for the year were as follows:

Additions and betterments—Road	
Expenditures by the Federal Manager.....	\$11,432,818.09
Expenditures by the corporation.....	126,860.84
	\$11,559,678.93
Less sale of land by corporation and miscellaneous credits.....	63,522.96
	\$11,496,155.97
Additions and betterments—Equipment	
Expenditures by the Federal Manager, less equipment retired and transferred.....	\$2,933,531.70
Equipment assigned to the N. Y. C. & H. R. by the United States Railroad Administration.....	13,002,056.00
Expenditures by the corporation.....	8,511,006.80
	24,446,594.50
Total addition to road and equipment accounts.....	\$35,942,750.47
Improvements on leased railway property	
Expenditures by the Federal Manager.....	\$4,783,284.40
Less miscellaneous credits by the corporation.....	11,911.68
	4,771,372.72
Improvements on miscellaneous physical property	
Expenditures by the Federal Manager.....	\$18,541.61
Expenditures by the corporation.....	52,293.74
	\$70,835.35
Less credits by the corporation.....	50,000.00
	20,835.35
The net increase in property investment accounts, during the year being.....	\$40,734,958.54
Pending the execution of the agreement with the Director General of	

Railroads and the settlement of accounts thereunder, the company borrowed from him \$20,000,000 for which it gave its 6 per cent demand notes. Of the notes so given \$13,500,000 were secured by collateral, the balance, \$6,500,000, being unsecured.

In the operation of the Pension Department, 107 employees were retired and placed upon the pension roll. Of these retirements, 43 were authorized because of the attainment of seventy years of age, and 64 because of total and permanent physical disability; 165 pensioners died during 1918, and at the close of the year 1,469 retired employees were carried upon the pension rolls. The average monthly pension allowance of these is \$26.34, and the total amount paid in pension allowances during the year was \$471,075.11, which was paid by and charged to the operating expenses of the United States Railroad Administration, as provided in the agreement with the Director General of Railroads.

The following changes took place in the Board of Directors during the year:

Resigned: March 13, 1918.....	Robert S. Lovett
April 10, 1918.....	Marvin Hughitt
May 31, 1918.....	Alfred H. Smith
Sept. 18, 1918.....	Frank J. Jerome
Sept. 18, 1918.....	Leonard J. Hackney
Elected: Sept. 18, 1918.....	Charles T. Lewis
Sept. 18, 1918.....	Charles B. Seger
Sept. 18, 1918.....	Edward S. Harkness
Nov. 13, 1918.....	Samuel Mather
Re-elected: Dec. 11, 1918.....	Frank J. Jerome

The Board records, with regret, the death on August 10, 1918, of Mr. William H. Newman, a Director of this Company, and who was President of The New York Central and Hudson River Railroad Company from June 3, 1901, to February 1, 1909.

The Board also records, with regret, the death of two other of its members, Mr. Charles T. Lewis, on September 29th, and Mr. Horace B. Andrews, on December 1st, 1918.

Appreciative acknowledgement is made to all officers and employees of their loyal and efficient co-operation and service.

For the Board of Directors,

WILLIAM K. VANDERBILT, JR.,
President.

APPENDIX

INCLUDED FOR INFORMATION FROM REPORTS SUPPLIED BY THE FEDERAL AUDITORS
REPORT OF OPERATIONS OF THE NEW YORK CENTRAL RAILROAD (EXCLUDING BOSTON AND ALBANY RAILROAD) BY THE UNITED STATES RAILROAD ADMINISTRATION FOR THE YEAR 1918

	1918	1917*	Increase or Decrease
	miles operated	miles operated	miles operated
INCOME ACCOUNT	5,681.82	5,685.43	3.61
OPERATING INCOME			
Railway operating revenues.....	\$269,270,956.51	\$216,267,517.22	\$53,003,439.29
Railway operating expenses.....	210,637,848.99	153,597,905.35	57,039,943.64
NET REVENUE FROM RAILWAY OPERATIONS.....	\$58,633,107.52	\$62,669,611.87	—\$4,036,504.35

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1918

ASSETS		LIABILITIES	
INVESTMENTS		STOCK	
Investment in road.....	\$472,010,405.09	Capital stock.....	\$249,597,355.00
Investment in equipment		LONG TERM DEBT	
Trust.....	\$116,733,517.07	Funded debt unmatured	
Other.....	141,642,599.21	Equipment obligations.....	\$41,591,201.45
	\$258,376,116.28	Mortgage bonds.....	526,194,000.00
Improvements on leased railway property		Debentures.....	105,500,000.00
Miscellaneous physical property.....	8,701,439.17	Notes.....	15,000,000.00
Investments in affiliated companies			688,285,201.45
Stocks.....	\$133,447,346.64	CURRENT LIABILITIES	
Bonds.....	9,735,838.38	Loans and bills payable.....	\$41,963,000.00
Notes.....	43,500,926.84	Traffic and car-service balances payable.....	2,239,089.84
Advances.....	14,968,985.60	Audited accounts and wages payable.....	4,380,970.65
	201,653,097.46	Miscellaneous accounts payable.....	5,921,122.51
Other investments		Interest matured unpaid.....	3,955,549.15
Stocks.....	\$31,140,024.32	Dividend declared, payable February 1, 1919.....	3,119,902.50
Bonds.....	3,858,079.67	Dividends matured unclaimed.....	170,630.42
Notes.....	11,780,026.03	Funded debt matured unpaid.....	4,790.00
Advances.....	712,514.11	Unmatured interest accrued.....	6,241,945.73
Miscellaneous.....	12,765.00	Unmatured rents accrued.....	748,207.37
	47,503,409.13	Other current liabilities.....	4,596,902.90
Total investments.....	\$1,085,148,041.57		73,342,111.07
CURRENT ASSETS		DEFERRED LIABILITIES	
Cash.....	\$8,993,280.27	Liability to lessor companies for equipment.....	\$14,715,322.52
Special deposits.....	981,245.14	United States Government	
Loans and bills receivable.....	59,108.99	Additions and betterments.....	\$16,650,703.63
Traffic and car-service balances receivable.....	41,509.59	Liabilities December 31, 1917, paid.....	21,512,363.92
Miscellaneous accounts receivable.....	6,815,012.76	Corporate transactions.....	8,214,989.85
Interest and dividends receivable.....	4,354,563.58	Revenue and expenses prior to January 1, 1918.....	6,906,821.83
Rents receivable		Other items.....	5,734,017.03
Compensation due from United States Government.....	27,672,084.92		\$59,018,896.26
	48,916,805.25	Other deferred liabilities.....	192,861.20
DEFERRED ASSETS			73,927,079.98
Working fund advances.....	\$124,392.30	UNADJUSTED CREDITS	
Insurance and other funds.....	908,611.38	Tax liability.....	\$2,553,255.51
United States Government		Insurance and casualty reserves.....	565,079.82
Cash taken over.....	\$13,407,045.26	Operating reserves.....	350,029.88
Agents and conductors balances.....	9,616,893.84	Accrued depreciation of equipment.....	32,806,683.77
Materials and supplies.....	34,239,829.70	Liability to lessor companies for securities acquired (per contra).....	457,851.00
Assets December 31, 1917, collected.....	6,919,234.06	Other unadjusted credits.....	13,970,888.63
Other items.....	5,163,370.15		50,703,788.61
	\$69,346,373.01	CORPORATE SURPLUS	
Other deferred assets.....	4,097,745.84	Additions to property through income and surplus.....	\$93,924.85
	74,477,122.53	Sinking fund reserves.....	643,547.39
UNADJUSTED DEBITS		Total appropriated surplus.....	\$737,472.24
Discount on funded debt unamortized.....	\$6,321,634.59	Profit and loss—balance.....	80,943,297.90
Securities acquired from lessor companies (per contra).....	457,851.00		81,680,770.14
Other unadjusted debits.....	2,214,851.31		
	8,994,336.90		
Securities issued or assumed—unpledged.....	(\$3,443,005.00)		
Securities issued or assumed—pledged.....	(\$24,687,000.00)		
Total.....	\$1,217,536,306.25	Total.....	\$1,217,536,306.25

Percentage of expenses to revenues	(78.23)	(71.02)	(7.21)
Railway taxes accrued.....	\$11,273,155.71	\$10,594,035.62	\$679,120.09
Uncollectible railway revenues.	17,594.44	19,395.51	—1,801.07
RAILWAY OPERATING INCOME.	\$47,342,357.37	\$52,056,180.74	—\$4,713,823.37
OTHER INCOME			
Joint facility rent income...	\$3,262,788.23	\$3,148,788.33	\$113,999.90
Income from interest on bank balances	59,331.16	284,520.60	—225,189.44
Revenues and expenses prior to 1918	6,194,711.69	.....	6,194,711.69
TOTAL OTHER INCOME...	\$9,516,831.08	\$3,433,368.93	\$6,083,522.15
GROSS INCOME	\$56,859,188.45	\$55,489,489.67	\$1,369,698.78

DEDUCTIONS FROM GROSS

INCOME			
Hire of equipment, debit balance	\$3,411,326.39	\$3,219,768.18	\$191,558.21
Joint facility rents.....	1,154,583.18	1,178,790.89	—24,207.71
Miscellaneous rents	62,737.99†	.....	62,737.99
Interest on unfunded debt..	133.21	.....	133.21
TOTAL DEDUCTIONS FROM GROSS INCOME	\$4,628,780.77	\$4,398,559.07	\$230,221.70
NET INCOME	\$52,230,407.68	\$51,090,930.60	\$1,139,477.08

*Figures for 1917 revised to agree with basis in 1918.

†Represents increase in rental of properties over amounts paid prior to January 1, 1918.

The Cleveland, Cincinnati, Chicago and St. Louis Railway Company—Thirtieth Annual Report

To the Stockholders of

THE CLEVELAND, CINCINNATI, CHICAGO AND ST. LOUIS RAILWAY COMPANY:
The Board of Directors herewith submits its report for the year ended December 31, 1918, with statements showing the results for the year and the financial condition of the company.

The operation and maintenance of the company's road were conducted under federal control during the year 1918. The mileage embraced in the operation of the road is as follows:

Main line and branches owned.....	1,693.03
Proprietary lines	126.09
Leased lines	204.43
Operated under contract.....	201.37
Trackage rights	170.85

Total road operated (as shown in detail on another page)

As compared with mileage operated in 1917, there was an increase in mileage of leased lines of 2.01 miles account of the Mt. Gilead Short Line Railroad, which heretofore had been reported as separately operated, and an increase of trackage rights of 6.85 miles over the Toledo Terminal Railroad between Stanley and Gould, Ohio, making an increase of 8.86 in mileage operated during 1918.

There was no change in capital stock during the year, the amounts authorized and issued to December 31, 1918, being as follows:

Preferred stock authorized.....	\$10,000,000.00
Common stock authorized.....	50,000,000.00
Total stock authorized.....	\$60,000,000.00
Preferred stock issued.....	\$10,000,000.00
Common stock issued.....	47,056,300.00
.....	57,056,300.00

Balance common stock authorized but not issued December 31, 1918.....

The funded debt unmatured outstanding December 31, 1917, was

It has been decreased during the year as follows:

Big Four Railway equipment trust certificates payable June 1, 1918.....	\$373,000.00
Big Four Railway equipment trust certificates payable July 1, 1918.....	115,000.00
Pro rata New York Central Lines equipment trust certificates payable November 1, 1918	246,689.81
C. I. St. L. & C. Ry. Co. general first mortgage bonds retired.....	76,000.00
C. I. St. L. & C. Ry. Co. first consolidated mortgage bonds retired.....	11,000.00
Central Grain Elevator Co. bonds retired.....	26,000.00
C. C. C. & St. L. Ry. Co. (St. Louis Division) first collateral trust mortgage bonds purchased for sinking fund.....	22,000.00
.....	869,689.81

Total funded debt outstanding December 31, 1918... \$98,361,594.81

The Big Four Railway Equipment Trust of 1917, established by agreement dated June 1, 1917, provides for a total issue of \$2,370,000 equipment trust certificates. The original agreement provided for an interest rate of 5 per cent per annum, but under date of December 31, 1918, by supplemental agreement, the interest rate was increased to 6 per cent per annum. Under the provisions of the Trust 20 locomotives and 30 passenger cars were delivered during the year.

The Big Four Railway Equipment Trust certificates issued during the year amounted to \$465,000. On account of the prevailing unsatisfactory market conditions for the sale of equipment trust certificates, and in order to procure equipment as needed, the company, through the medium of short-term loans, purchased at par and accrued interest these certificates, using \$317,000 of them as collateral, pending more favorable conditions for their sale. There is therefore no change in the funded debt in this connection.

As was pointed out in the last annual report, the President of the United States took possession and assumed control of the railroad property of your company on December 28, 1917. By the terms of the President's proclamation the possession, control, operation, and utilization of the transportation systems were vested in a Director General; and it was stated that, until the Director General should otherwise determine, his powers would be exercised through the boards of directors, officers, and employees of the systems taken over. The Director General appointed regional directors under whom the railroads of the several districts were unified as to control and operation. Subsequently, Federal Managers and other Federal officers were appointed and required to report through the Federal Managers to the Regional Director and the Director General.

As of December 27, 1918, the company, jointly with The Muncie Belt Railway Company, executed an agreement with the Director General of Railroads providing for the operation, during federal control, of the roads of the parties to the agreement by the Director General of Railroads for an annual total standard compensation of \$9,945,738.41, divided as follows:
The Cleveland, Cincinnati, Chicago and St. Louis Ry. Co. \$9,938,597.23
The Muncie Belt Railway Company..... 7,141.18

Total

Under the agreement, all salaries and expenditures incurred by the company, during federal control, for purposes which relate to the existence and maintenance of the corporation, are required to be borne by the corporation out of its compensation and other income.

Immediately upon his taking office, the Director General of Railroads appointed as Regional Director in charge of the Eastern District, Mr. Alfred H. Smith, then President of this company. This District at that time

included practically all the railroad lines in the district north of the Ohio and Potomac Rivers and east of the Indiana-Illinois state line. Mr. Smith assumed the duties of the Regional Director's office, which involved dealing with a complicated traffic situation and the co-ordinating of the lines for war purposes, as an addition to his obligations as President of this company.

Early in 1918, the Director General decided that officers in charge of Federal operation should not continue their positions with the corporation, except in special cases and where permission was given. Thereupon, Mr. Smith resigned his office as President, effective May 31st, and Mr. William K. Vanderbilt, Jr., was elected in his stead. Later in the year Mr. Abraham T. Hardin, Vice-President, and Mr. Harry A. Worcester, Vice-President and General Manager also resigned in order that they might continue in the service of the United States Railroad Administration.

A separate corporate organization has been formed to conduct the affairs of the company under instructions from the President and the Board of Directors, and to take all appropriate and necessary corporate action to carry out the obligations assumed by it under the agreement. Through this organization, the personnel of which is shown on the first page of this report, expenditures for additions and betterments to the property, and for the maintenance of road and equipment under federal management, are investigated and verified and supervision is exercised for the protection of the company's interests, both as to the property transferred under the Federal Control Act, and that remaining with the corporation.

Pending the execution of the agreement with the Director General of Railroads and the settlement of accounts thereunder, the company borrowed \$5,300,000, of which \$4,300,000 were obtained from the Director General of Railroads and the Secretary of the Treasury, for which the company gave \$2,500,000 of 6 per cent demand notes secured by collateral and \$1,800,000 unsecured. For the balance of \$1,000,000, an unsecured 6 per cent demand note was given by the company to The New York Central Railroad Company, endorsed by that company and sold by it to the Director General of Railroads.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME

	Year ended December 31, 1918
Compensation accrued for the possession, use and control of the property of this company and its leased lines.....	\$9,938,597.23
REVENUES FROM MISCELLANEOUS OPERATIONS	
Revenues	\$18,842.68
Expenses and taxes.....	16,867.55
MISCELLANEOUS OPERATING INCOME.....	1,975.13
OTHER CORPORATE INCOME	
Miscellaneous rent income.....	\$195,016.70
Miscellaneous non-operating physical property. Separately operated properties—profit.....	81,107.27
Dividend income	2,797.20
From funded securities.....	74,705.89
From unfunded securities and accounts.....	238,218.40
Release of premium on funded debt.....	234,546.14
Miscellaneous income	1,885.80
.....	3,427.88
TOTAL OTHER CORPORATE INCOME.....	831,705.28
GROSS INCOME	\$10,772,277.64
DEDUCTIONS FROM GROSS INCOME	
Miscellaneous rents	\$141,315.15
Miscellaneous tax accruals.....	469.86
Separately operated properties—loss.....	64,290.97
Rent for leased roads.....	561,280.09
Interest on funded debt.....	4,580,303.37
Interest on unfunded debt.....	505,581.75
Amortization of discount on funded debt.....	9,026.69
Miscellaneous income charges	56,392.50
War tax accrued.....	74,825.62
Corporate general expenses.....	42,085.45
DEDUCTIONS FROM GROSS INCOME.....	6,035,571.45
Less revenues and expenses applicable to the period prior to January 1, 1918, settled for account of the corporation by United States Railroad Administration	\$4,736,706.19
NET CORPORATE INCOME.....	\$3,120,363.12
DISPOSITION OF NET INCOME	
Dividends declared—5 per cent preferred stock	\$499,925.00
Sinking funds	31,894.10
Investment in physical property.....	95,530.40
TOTAL APPROPRIATIONS OF INCOME.....	627,349.50
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	\$2,493,013.62
Amount to credit of profit and loss, December 31, 1917	\$9,661,133.72
Add:	
Surplus for year 1918.....	\$2,493,013.62
Unrefundable overcharges	13,360.31
Reacquisition of securities below par.....	15,357.60
Unclaimed wages and pensions 1912.....	6,524.94
.....	2,528,256.47
.....	\$10,772,277.64

DEDUCT:

Interest to December 31, 1917, on advances by New York Central Railroad Co. for purchase of coal lands in the State of Illinois.....	\$546,267.60
Unaccrued depreciation prior to July 1, 1907, on equipment retired during 1918.....	123,983.21
Operations of Peoria and Eastern Railway included in income account for 1918 and credited to that company.....	107,341.11
Refund of freight overcharges previously written off.....	24,199.66
Surplus appropriated for investment in physical property.....	3,438.97
Adjustment of sundry accounts (net).....	58,550.48
	863,781.03

BALANCE TO CREDIT OF PROFIT AND LOSS

DECEMBER 31, 1918.....\$11,325,609.16
The amount of standard compensation, \$9,938,597.23, accrued under federal control for the possession and use of the company's property, and its leased and operated lines, was based upon the average annual railroad operating income for the three years ended June 30, 1917. As required by the Federal Control Act, this amount was certified by the Interstate Commerce Commission as agreeing with the income reported to it, subject, however, to such changes and corrections as the Commission might hereafter determine and certify to be requisite.

The Director General of Railroads allotted to the company 2,000 freight cars, estimated to cost \$5,736,000, and 35 locomotives, estimated to cost \$1,780,000, a total of approximately \$7,516,000. Of this equipment 1,246 freight cars and 25 locomotives were delivered during the year. These allotments were accepted by the company and the equipment is being constructed under contracts between the Director General and the builders and the financing of the cost thereof is being arranged between the Director General and the company.

The changes in the road and equipment accounts for the year were as follows:

Additions and betterments—Road	
Expenditures by the Federal Manager.....	\$4,088,370.76
Expenditures by the corporation.....	52,283.58
	\$4,140,654.34
Additions and betterments—Equipment	
Equipment assigned to the C. C. C. & St. L. Ry. by the United States Railroad Administration.....	\$4,875,074.00
Expenditures by the Federal Manager less equipment retired and transferred.....	78,483.15
Expenditures by the corporation.....	1,344,469.35
	6,298,026.50
Improvements on leased railway property	
Expenditures by the Federal Manager.....	\$229,458.28
Expenditures by the corporation.....	1,774.85
	231,233.13
Total (as shown in detail on other pages)	\$10,669,913.97

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1918

ASSETS

INVESTMENTS		
Investment in road and equipment.....	\$172,342,676.82	
Improvements on leased railway property.....	705,103.21	
Sinking funds.....	652.42	
Miscellaneous physical property.....	2,341,825.32	
Investments in affiliated companies		
Stocks.....	\$6,798,534.16	
Bonds.....	5,285,402.00	
Notes.....	3,000.00	
Advances.....	1,177,167.61	
	\$13,266,103.77	
Other investments		
Stocks.....	\$36.00	
Bonds.....	1,115,166.45	
Notes.....	30,775.15	
Advances.....	81,000.00	
Miscellaneous.....	1,330.00	
	\$1,228,307.60	
CURRENT ASSETS		
Cash.....	\$1,277,803.60	
Special deposits.....	623,631.41	
Loans and bills receivable.....	650.00	
Traffic and car-service balances receivable.....	29,583.58	
Miscellaneous accounts receivable.....	646,335.78	
Interest and dividends receivable.....	26,220.50	
Rents receivable.....		
Compensation due from United States Government.....	\$7,295,738.41	
Miscellaneous.....	17,411.34	
	\$7,313,149.75	
Other current assets	812.75	9,918,187.37
DEFERRED ASSETS		
Working fund advances.....	\$8,881.99	
Other deferred assets.....	261,883.69	
United States Government		
Cash taken over.....	\$1,655,048.11	
Agents and conductors balances.....	3,235,259.67	
Materials and supplies.....	5,381,116.19	
Assets, December 31, 1917, collected.....	5,133,017.72	
Equipment retired.....	505,090.47	
Miscellaneous.....	337,907.73	
	\$16,247,439.89	16,518,205.57
UNADJUSTED DEBITS		
Rents and insurance paid in advance.....	\$111.41	
Discount on funded debt.....	52,960.22	
Other unadjusted debits.....	2,181,268.66	
	\$2,334,340.29	
Securities issued or assumed—unpledged..	(\$163,330.00)	
Securities issued or assumed—pledged....	(\$6,963,000.00)	
Total	\$218,555,402.37	

APPENDIX

INCLUDED AS INFORMATION FROM REPORTS SUPPLIED BY THE FEDERAL AUDITOR

RESULTS OF OPERATIONS OF THE CLEVELAND, CINCINNATI, CHICAGO AND ST. LOUIS RAILROAD BY THE UNITED STATES RAILROAD ADMINISTRATION FOR THE YEAR 1918 AS REPORTED TO THE INTERSTATE COMMERCE COMMISSION

	1918	1917	INCREASE OR DECREASE
INCOME ACCOUNT			
Railway operating revenues.....	\$71,403,970.21	\$52,650,920.24	\$18,753,049.97
Railway operating expenses.....	51,895,288.69	38,059,421.05	13,835,867.64
NET REVENUE FROM RAILWAY OPERATIONS	\$19,508,681.52	\$14,591,499.19	\$4,917,182.33
Percentage of expenses to revenues	(72.68)	(72.29)	(.39)
Railway tax accruals.....	\$3,538,917.93	\$2,144,867.99*	\$1,394,049.94

LIABILITIES

STOCK		
Capital stock.....		\$57,027,200.00
LONG TERM DEBT		
Funded debt unmatured		
Equipment obligations.....	\$10,358,488.87	
Mortgage bonds.....	59,146,500.00	
Collateral trust bonds.....	9,194,000.00	
Miscellaneous obligations.....	19,662,605.94	
	\$98,361,594.81	
Non-negotiable debt to affiliated companies	6,025,927.00	104,387,521.81
CURRENT LIABILITIES		
Loans and bills payable.....	\$8,327,650.00	
Audited accounts and wages payable.....	212,549.90	
Miscellaneous accounts payable.....	38,466.23	
Interest matured unpaid.....	1,079,218.19	
Dividends matured unpaid.....	7,898.77	
Unmatured dividends declared.....	124,981.25	
Unmatured interest accrued.....	739,273.46	
Unmatured rents accrued.....	103,103.40	
Other current liabilities.....	5,514,948.18	
	\$16,148,089.38	
DEFERRED LIABILITIES		
Other deferred liabilities.....	\$2,344,478.72	
United States Government		
Additions and betterments.....	\$5,186,803.64	
Liabilities, December 31, 1917, paid....	7,360,837.55	
Corporate transactions.....	4,607,356.41	
Expenses prior to January 1, 1918.....	1,574,242.46	
Miscellaneous.....	153,389.66	
	\$18,882,629.72	21,227,108.44
UNADJUSTED CREDITS		
Tax liability.....	\$213,925.12	
Premium on funded debt.....	9,272.44	
Accrued depreciation—equipment.....	5,505,568.14	
Other unadjusted credits.....	1,338,044.64	
	7,066,810.34	
CORPORATE SURPLUS		
Additions to property through income and surplus.....	\$845,735.71	
Sinking fund reserves.....	527,327.53	
Total appropriated surplus	\$1,373,063.24	
Profit and loss—balance	11,325,609.16	12,698,672.40

Total.....\$218,555,402.37

In the operation of the Pension Department 32 employees were retired and placed upon the pension roll; of these retirements 18 were authorized because of the attainment of seventy years of age, and 14 because of total and permanent physical disability; 39 pensioners died during 1918, and at the close of the year 313 retired employees were carried upon the pension rolls. The average monthly pension allowance of these is \$23.06, and the total amount paid in pension allowances during the year was \$86,471.77, which was paid by and charged to the operating expenses of the United States Railroad Administration as provided in the agreement with the Director General of Railroads.

The following change took place in the Board of Directors during the year:

Resigned:	March 13, 1918.....	Robert S. Lovett
	May 31, 1918.....	Alfred H. Smith
	May 31, 1918.....	Harry A. Worcester
	September 18, 1918.....	Frank J. Jerome
	September 18, 1918.....	Leonard J. Hackney
Elected:	September 18, 1918.....	Charles T. Lewis
	September 18, 1918.....	Charles B. Seger
	September 18, 1918.....	Edward S. Harkness
	September 18, 1918.....	Horace E. Andrews
	October 30, 1918.....	Samuel Mather
Re-elected:	December 11, 1918.....	Leonard J. Hackney

The Board records, with regret, the death on August 10, 1918, of Mr. William H. Newman, a Director of the Company, and who was President of the Company from January 31, 1905, to February 1, 1909.

The Board also records, with regret, the deaths of two other of its members, Mr. Charles T. Lewis, on September 29th, and Mr. Horace E. Andrews, on December 1st, 1918.

Appreciative acknowledgement is made to all officers and employees of their loyal and efficient co-operation and service.

For the Board of Directors,

WILLIAM K. VANDERBILT, JR., President.

RAILWAY OPERATING INCOME.....	\$15,962,010.89	\$12,436,999.07	\$3,525,011.82
INCOME ITEMS			
Equipment rents—net debit	\$944,058.60	\$1,804,641.57	—\$860,582.97
Joint facility rents—net debit	329,013.86	95,882.57	233,131.29
NET RAILWAY OPERATING INCOME	\$14,688,938.43	\$10,536,474.93	\$4,152,463.50
Other income items.....	1,678,716.63		

Uncollectible railway revenues	7,752.70	9,632.13	—1,879.43
NET INCOME	\$16,367,655.06		
Average number of miles of road operated	2,395.77	2,386.91	8.86

*Adjusted for comparative purposes by eliminating the federal income and excess profits taxes accrued in 1917 which compare with the taxes which the corporation is required to pay for 1918.

The Michigan Central Railroad Company—Seventy-Third Annual Report

To the Stockholders of

THE MICHIGAN CENTRAL RAILROAD COMPANY:
The Board of Directors herewith submits its report for the year ended December 31, 1918, with statements showing the results for the year and the financial condition of the company.
The operation and maintenance of the company's road were conducted under federal control during the year 1918, the mileage covered being as follows:

Main line and branches owned	Miles
Line jointly owned.....	1,182.84
Leased lines .....	.71
Lines operated under trackage rights.....	578.16
	100.06

Total road operated (as shown in detail on another page)

There was no change in capital stock during the year, the amount authorized being \$18,738,000 and actually outstanding \$18,736,400. The funded debt outstanding on December 31, 1917, was \$52,738,843.79. It has been decreased during the year by payment of pro-rata of installments on account of equipment trust certificates as follows:
Trust of 1907, due November, 1918 (N. Y. C. Lines)

Trust of 1915, due October, 1918 (M. C. R. R.)

Total funded debt outstanding December 31, 1918

Of the \$8,000,000 refunding and improvement mortgage bonds authorized in 1917 there were issued during the year \$6,171,000, but as all of them, pending their sale, are held by the company and pledged as collateral for short term loans there was no change in the funded debt in this connection.

Michigan Central Railroad Equipment Trust certificates of 1917 issued during the year amounted to \$3,848,000. On account of the prevailing unsatisfactory market conditions for the sale of equipment trust certificates, and in order to procure equipment as needed, the company, through the medium of short-term loans, purchased at par and accrued interest these certificates, pledging \$3,658,000 of them as collateral, pending more favorable conditions for their sale. There is therefore no change in the funded debt in this connection.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME

	Year ended December 31, 1918
Compensation accrued for the possession, use and control of the property of this company and its leased lines.....	\$8,052,127.48
OTHER CORPORATE INCOME	
Income from lease of road.....	\$123.43
Miscellaneous rent income.....	2,883.56
Miscellaneous non-operating physical property	2,881.23
Dividend income	487,540.00
From funded securities.....	48,579.78
From unfunded securities and accounts.....	359,257.06
Miscellaneous income	1,714.81
TOTAL OTHER CORPORATE INCOME	902,979.87
GROSS INCOME	\$8,955,107.35
DEDUCTIONS FROM GROSS INCOME	
Miscellaneous rents	\$3,208.88
Miscellaneous tax accruals.....	5,379.92
Rent for leased roads.....	2,774,022.11
Interest on funded debt.....	2,077,363.38
Interest on unfunded debt.....	1,282,387.40
Amortization of discount on funded debt.....	22,482.24
Miscellaneous income charges.....	8,645.02
Separately operated properties—loss.....	58,883.36
War taxes accrued	81,566.38
Corporate general expenses.....	71,605.54
DEDUCTIONS FROM GROSS INCOME.....	6,385,544.23
	\$2,569,563.12
Less revenue and expenses applicable to the period prior to January 1, 1918, settled for account of the corporation by United States Railroad Administration	2,021,705.41
NET CORPORATE INCOME.....	\$547,857.71
DISPOSITION OF NET INCOME	
Dividends declared—4 per cent.....	749,456.00
DEFICIT FOR THE YEAR CARRIED TO PROFIT AND LOSS	
Amount to credit of profit and loss, December 31, 1917.....	\$201,598.29
ADD:	
Profit from sale of land at Detroit.....	\$96,960.00
Readjustment of advances and interest to December 31, 1917, account Detroit Terminal Railroad Company.....	211,469.88
Profit in connection with sale of rail leased to Eastman Lumber Company.....	12,643.17
Proceeds from sale of grain at Elevator B, Detroit	6,762.32
Adjustment of sundry accounts (net).....	63,963.80
	391,799.17
	\$18,980,935.91
DEDUCT:	
Deficit for year 1918.....	\$201,598.29
Depreciation unaccrued prior to July 1, 1907, on equipment retired during 1918.....	311,910.04

Adjustment of overaccrual prior to December 31, 1917, of mail revenue.....	18,672.17	532,180.50
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BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1918.....	\$18,448,755.41
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As was pointed out in the last annual report, the President of the United States took possession and assumed control of the railroad property of your company on December 28, 1917. By the terms of the President's proclamation the possession, control, operation, and utilization of the transportation systems were vested in a Director General; and it was stated that, until the Director General should otherwise determine, his powers would be exercised through the boards of directors, officers, and employees of the systems taken over. The Director General appointed regional directors under whom the railroads of the several districts were unified as to control and operation.

Subsequently, Federal Managers and other Federal Officers were appointed and required to report through the Federal Managers to the Regional Director and the Director General.

As of December 27, 1918, the company, jointly with the Chicago, Kalamazoo & Saginaw Railway Company, executed an agreement with the Director General of Railroads providing for the operation, during federal control, of the roads of the parties to the agreement by the Director General of Railroads for an annual total standard compensation of \$8,105,727.04, divided as follows:

The Michigan Central Railroad Company.....	\$8,052,127.48
Chicago, Kalamazoo & Saginaw Railway Company....	53,599.56
	\$8,105,727.04

Under the agreement, all salaries and expenditures incurred by the company, during federal control, for purposes which relate to the existence and maintenance of the corporation, are required to be borne by the corporation out of its compensation and other income.

Immediately upon his taking office, the Director General of Railroads appointed as Regional Director in charge of the Eastern District, Mr. Alfred H. Smith, then President of this Company. This District at that time included practically all the railroad lines in the district north of the Ohio and Potomac Rivers and east of the Indiana-Illinois State Line. Mr. Smith assumed the duties of the Regional Director's office, which involved dealing with a complicated traffic situation and the co-ordinating of the lines for war purposes, as an addition to his obligations as President of this company.

Early in 1918, the Director General decided that officers in charge of federal operations should not continue their positions with the corporation, except in special cases and where permission was given. Thereupon, Mr. Smith resigned his office as President, effective May 31st, and Mr. William K. Vanderbilt, Jr., was elected in his stead. Later in the year the following general executive officers also resigned in order that they might continue in the service of the United States Railroad Administration:

Mr. Abraham T. Hardin, Vice-President; Mr. Charles F. Daly, Vice-President, and Mr. Edmond D. Bronner, Vice-President and General Manager.

A separate corporate organization has been formed to conduct the affairs of the company under instructions from the President and the Board of Directors, and to take all appropriate and necessary corporate action to carry out the obligations assumed by it under the agreement. Through this organization, the personnel of which is shown on the first page of this report, expenditures for additions and betterments to the property, and for the maintenance of road and equipment under federal management, are investigated and verified and supervision is exercised for the protection of the company's interests, both as to the property transferred under the Federal Control Act, and that remaining with the corporation.

The amount of standard compensation, \$8,052,127.48, accrued under federal control for the possession and use of the company's property and its leased and operated lines, was based upon the average annual railroad operating income for the three years ended June 30, 1917. As required by the Federal Control Act, this amount was certified by the Interstate Commerce Commission as agreeing with the income reported to it, subject, however, to such changes and corrections as the Commission might hereafter determine and certify to be requisite.

Pending the execution of the agreement with the Director General of Railroads and the settlement of accounts thereunder, the company borrowed \$7,050,000, of which \$4,000,000 were obtained from the Director General of Railroads and the Secretary of the Treasury on 6% demand notes secured by collateral, and \$3,050,000 from The New York Central Railroad Company on unsecured notes, endorsed by that company and sold by it to the Director General of Railroads.

The Michigan Central Railroad Equipment Trust of 1917, established by agreement dated March 1, 1917, provides for a total issue of \$9,000,000 equipment trust certificates. The original agreement provided for an interest rate of 4½% per annum. Under date of December 31, 1918, by supplemental agreement, the interest rate was increased to 6% per annum. Under the provisions of the trust 3,470 freight train cars were delivered in 1918.

The Director General of Railroads allotted to the company 2,000 freight cars, estimated to cost \$5,747,000, and 30 locomotives, estimated to cost \$1,512,000, a total of approximately \$7,259,000. These allotments were accepted by the company and of this equipment 827 freight train cars and 20 locomotives were delivered during the year.

This equipment is being constructed under contracts between the Director General and the builders and the financing of the cost thereof is being arranged between the Director General and the company.

The changes in the road and equipment accounts for the year were as follows:

ADDITIONS AND BETTERMENTS—ROAD		
Expenditures by the Federal Manager.....	\$2,066,319.88	
Expenditures by the corporation.....	1,533.80	\$2,067,853.68
ADDITIONS AND BETTERMENTS—EQUIPMENT		
Equipment assigned to the M. C. R. R. by the U. S. R. R. Administration.....	\$3,302,419.00	
Expenditures by the Federal Manager less equipment retired and transferred.....	118,830.12	
Expenditures by the corporation.....	5,119,481.66	8,540,730.78

Improvements on leased railroad property		
Expenditures by the Federal Manager.....	\$162,187.13	
Less miscellaneous credits by the corporation	725.87	161,461.26
Total (as shown in detail on other pages)		\$10,770,045.72

In the operation of the Pension Department, 24 employees were retired and placed upon the pension roll; of these retirements 5 were authorized because of the attainment of seventy years of age, and 19 because of total and permanent physical disability. 29 pensioners died during 1918, and at the close of the year 288 retired employees were carried upon the pension rolls. The average monthly pension allowance of these is \$23.82, and the total amount paid in pension allowances during the year was \$82,635.68, which was paid by and charged to the operating expenses of the United States Railroad Administration as provided in the agreement with the Director General of Railroads.

The following changes took place in the Board of Directors during the year:

Resigned: April 10, 1918.....	Robert S. Lovett
April 10, 1918.....	Marvin Hughitt
May 31, 1918.....	Alfred H. Smith
Elected: September 18, 1918.....	Charles B. Seger
September 18, 1918.....	Edward S. Harkness
October 16, 1918.....	Samuel Mather
October 16, 1918.....	Henry Russell

The Board records with regret, the death on August 10, 1918, of Mr. William H. Newman, a Director of the company and who was President of the company from January 31, 1905, to February 1, 1909.

The Board also records, with regret, the death on December 1, 1918, of Mr. Horace E. Andrews, a Director of the company.

Appreciative acknowledgment is made to all officers and employees of their loyal and efficient co-operation and services.

For the Board of Directors,

WILLIAM K. VANDERBILT, JR.,
President.

APPENDIX

INCLUDED AS INFORMATION FROM REPORTS SUPPLIED BY FEDERAL AUDITOR
REPORT OF OPERATIONS OF THE MICHIGAN CENTRAL RAILROAD BY UNITED STATES
RAILROAD ADMINISTRATION FOR YEAR 1918 AS REPORTED TO
THE INTERSTATE COMMERCE COMMISSION

INCOME ACCOUNT	1918 1,861.77 miles operated	1917 1,861.77 miles operated	Increase or decrease
OPERATING INCOME			
Railway operating revenues.....	\$68,520,087.06	\$52,879,434.29	\$15,640,652.77
Railway operating expenses.....	51,070,072.12	38,289,136.32	12,780,935.80

INCOME ACCOUNT	1918 1,861.77 miles operated	1917 1,861.77 miles operated	Increase or decrease
NET REVENUE FROM RAIL- WAY OPERATIONS	\$17,450,014.94	\$14,590,297.97	\$2,859,716.97
Percentage of expenses to revenues.....	(74.53)	(72.41)	(2.12)
Railway tax accruals.....	\$1,899,790.41	\$1,762,795.37*	\$136,995.04
Uncollectible railway reve- nues	7,463.31	13,405.98	—\$5,942.67
RAILWAY OPERATING IN- COME	\$15,542,761.22	\$12,814,096.62	\$2,728,664.60
NON-OPERATING INCOME			
Rent from locomotives.....	\$42,835.11	\$45,476.76	—\$2,641.65
Rent from passenger-train cars	105,080.27	140,865.51	—35,785.24
Rent from work equipment	38,819.56	18,318.41	20,501.15
Joint facility rent income..	229,268.70	225,778.53	3,490.17
Income from unfunded se- curities and accounts ..	85,769.80	†	85,769.80
Miscellaneous income	2,019,705.41	†	2,019,705.41
TOTAL NON-OPERATING INCOME	\$2,521,478.85	\$430,439.21	\$2,091,039.64
GROSS INCOME.....	\$18,064,240.07	\$13,244,545.83	\$4,819,704.24
DEDUCTIONS FROM GROSS INCOME			
Hire of freight cars—debit balance	\$1,507,426.72	\$3,358,129.26	—\$1,850,702.54
Rent for locomotives.....	51,994.54	68,147.03	—16,152.49
Rent for passenger-train cars	177,099.62	320,613.93	—143,514.31
Rent from work equipment..	31,889.78	5,121.45	26,768.33
Joint facility rents.....	583,874.57	606,137.80	—22,263.23
Interest on unfunded debt.	12.53	†	12.53
TOTAL DEDUCTIONS FROM GROSS INCOME	\$2,352,297.76	\$4,358,149.47	—\$2,005,851.71
NET INCOME.....	\$15,711,942.31	\$8,886,386.36	\$6,825,555.95

*Revised for comparative purposes.

†Figures for 1917 not comparable.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1918

ASSETS		LIABILITIES	
INVESTMENTS		STOCK	
Investment in road and equipment		Capital stock	
Road and equipment to June 30, 1907.....		Book liability at date.....	
Road and equipment since June 30, 1907		Held by or for carrier at date.....	
Road		1,600.00	
Equipment—trust		Actually outstanding at date.....	
Equipment—owned		\$18,736,400.00	
\$70,139,522.83		LONG TERM DEBT	
Total investment in road and equip- ment		Funded debt unmatured	
\$105,352,779.92		Equipment obligations	
Deposits in lieu of mortgaged property sold.		\$11,388,418.34	
Improvements on leased rail property		Mortgage bonds	
To June 30, 1907.....		33,156,000.00	
Since June 30, 1907.....		Miscellaneous obligations	
\$823,773.76		Gold debentures of 1909.....	
1,867,447.92		7,634,000.00	
2,691,221.68		52,178,418.34	
Miscellaneous physical property.....		CURRENT LIABILITIES	
Investments in affiliated companies		Loans and bills payable.....	
Stocks		\$22,885,228.00	
Bonds		Audited accounts and wages unpaid.....	
Notes		787,153.35	
Advances		Miscellaneous accounts payable.....	
660,026.35		109,232.75	
11,289,889.48		Interest matured unpaid.....	
Other investments		78,435.00	
Stocks		Dividends matured unpaid.....	
Bonds		4,646.00	
Miscellaneous		Funded debt matured unpaid.....	
25,001.00		2,000.00	
260,365.62		Unmatured dividends declared.....	
Total investments		374,728.00	
\$120,276,935.55		Unmatured interest accrued.....	
CURRENT ASSETS		596,326.90	
Cash		Unmatured rents accrued.....	
Special deposits		457,272.26	
Loans and bills receivable.....		25,295,022.26	
Miscellaneous accounts receivable.....		DEFERRED LIABILITIES	
Interest and dividends receivable.....		United States Government	
Rents receivable		Additions and betterments.....	
Compensation due from United States		\$4,361,668.39	
Government		Revenue prior to January 1, 1918.....	
5,055,727.04		103,289.60	
7,235,046.62		Corporate transactions	
DEFERRED ASSETS		2,942,793.10	
Working fund advances.....		Liabilities December 31, 1917, paid.....	
\$29,508.10		10,365,439.22	
United States Government		Expenses prior to January 1, 1918.....	
Cash taken over.....		1,812,711.30	
\$2,713,163.02		Other items	
Agents and conductors balances.....		53,405.14	
Material and supplies.....		\$19,639,306.75	
Assets December 31, 1917, collected.....		338,068.72	
4,045,116.89		19,977,375.47	
Equipment retired		UNADJUSTED CREDITS	
Other items		Tax liability	
298,962.42		\$81,566.38	
Cash transferred subsequent to December		Operating reserves	
31, 1917		69,460.34	
411,350.73		Accrued depreciation—road and equipment.....	
\$22,059,249.12		5,842,971.10	
Other deferred assets.....		Accrued depreciation—miscellaneous physical property	
3,297.33		6,949.38	
22,092,054.55		3,604,773.64	
UNADJUSTED DEBITS		9,605,720.84	
Rents and insurance premiums paid in advance		CORPORATE SURPLUS	
\$47.06		Additions to property through income and surplus	
Discount on funded debt.....		\$6,455,884.64	
779,702.26		Profit and loss—balance.....	
Other unadjusted debits.....		18,448,755.41	
313,790.92		24,904,640.05	
Securities issued or assumed—unpledged.....			
421,600.00			
Securities issued or assumed—pledged.....			
14,042,000.00			
1,093,540.24			
TOTAL		TOTAL	
\$150,697,576.96		\$150,697,576.96	

[Adv.]

Railway Officers

Railroad Administration

Operating

O. J. Nelson, trainmaster on the Chicago, Burlington & Quincy, with headquarters at Alliance, Neb., has been promoted to assistant superintendent with headquarters at Greybull, Wyo., to succeed **C. C. Holtorf**, who has been transferred to the Wymore (Neb.) division.

Newman Kline, division superintendent on the Northern Pacific, with headquarters at Minneapolis, Minn., has been promoted to general superintendent with headquarters at St. Paul, Minn., to succeed **C. L. Nichols**, whose promotion to assistant general manager was noticed in the *Railway Age* of June 6 (page 1450).

Traffic

R. N. Golden, general agent of the Chicago, Milwaukee & St. Paul, at Cincinnati, Ohio, has resigned to become general agent of the Shippers & Manufacturers Export Corporation, Marquette, Bldg., Chicago.

D. G. Gray, freight traffic manager of the Baltimore & Ohio, Eastern lines, and assistant freight traffic manager of the Western Maryland, with headquarters at Baltimore, Md., has been appointed assistant traffic manager of the Baltimore & Ohio, Western lines, with headquarters at Chicago, Ill.

Engineering and Rolling Stock

Herman F. Noyes, traveling engineer of the Maine Central, has been appointed superintendent of fuel economy of that road and the Portland Terminal, with office at Portland, Maine.

Albert M. Traugott, whose appointment as acting chief engineer of the Virginian Railroad, with headquarters at Norfolk, Va., was announced in the *Railway Age* of May 9 (page 1184) was born on July 31, 1882, at Rochester, N. Y. He was educated at Purdue University and during his summer vacations worked as a chainman with the Buffalo, Rochester & Pittsburgh, and later as a rodman on the Delaware, Lackawanna & Western. In February, 1903, he entered the service of the Virginian Railroad and has served successively as rodman, draftsman, instrumentman, resident engineer on construction work and later as locating engineer on preliminary surveys. In February, 1913, he was appointed resident engineer of the Norfolk division, and one year later became division engineer of the third and Deepwater divisions, which position he held until his recent appointment as acting chief engineer, as above noted.

Charles J. Scudder has been appointed superintendent of shops of the Delaware, Lackawanna & Western, with headquarters at Scranton, Pa., vice **Joseph Grieser**, assigned to other duties.

H. G. Clark, who was chief engineer of the Chicago, Rock Island & Pacific prior to the return of C. A. Morse, as noted in the *Railway Age* of June 13, page 1450, has been appointed

assistant to the federal manager, succeeding **H. M. Sloane**, who has resigned to become assistant to the president of the Chicago, Milwaukee & St. Paul.

Purchasing

R. R. Jackson has been appointed division storekeeper of the Pittsburgh division of the Baltimore & Ohio, Eastern Lines, with headquarters at Glenwood, Pa., vice **T. C. Hopkins**, assigned to other duties.

Corporate

Executive, Financial, Legal and Accounting

A. H. Barnes, auditor of the Kansas City Southern has been appointed in addition assistant secretary succeeding **J. M. Souby**, solicitor and assistant secretary. Mr. Souby retains his position as solicitor.

Traffic

R. W. Long, division freight agent on the Grand Trunk, with office at Hamilton, Ont., has been transferred to Toronto, vice **L. Macdonald**, promoted; **R. J. S. Weatherston**, division freight agent at Ottawa, has been transferred to Hamilton, vice Mr. Long, and **E. J. Hilliard**, commercial agent at Buffalo, N. Y., has been appointed division freight agent, with office at Ottawa, Ont., vice Mr. Weatherston, transferred.

Obituary

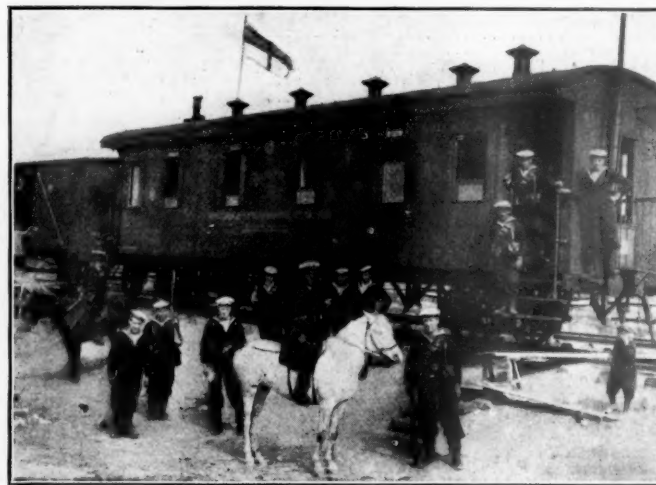
Carl Remington, assistant secretary of the Chesapeake & Ohio Railway Company and the Hocking Valley Railway Company, with office at New York, died in that city on June 6. Up to January, 1918, Mr. Remington was secretary of these roads, and for about a year he had been out of active service on account of ill health.

Joseph C. Thompson, formerly district passenger agent of the Northern Pacific with headquarters at Chicago and recently connected with the Chicago Consolidated Ticket Offices, died at Chicago on June 10. Mr. Thompson was also president of the Tri-State Passenger Agents' Association prior to government control and was a brother of E. Thompson, secretary of the Western Passenger Traffic Committee.

The new shops of the Canadian National at Leaside, near Toronto, were opened for business this week. Construction work is practically completed. The plant consists of a roundhouse, powerhouse, administration building, locomotive repair shop and car repair shop.



A. M. Traugott



British Officers and Bluejackets at Soroka—on the Murmansk-Archangel Railway